United Nations Development Programme

Government of Georgia

PIMS 4335: Promotion of Biomass Production and Utilization in Georgia

Terminal Evaluation (TE) Report

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BASIC REPORT INFORMATION

Title of UNDP supported GEF financed project: Promotion of Biomass Production and Utilization in Georgia

UNDP PIMS#: 4335

GEF project ID#: 4157

Terminal Evaluation Review time frame: July 2013 – September 2017

Date of Terminal Evaluation Review report: 6 November 2017

Region and countries included in the project: Caucasus region, Georgia

GEF Operational Focal Area/Strategic Program: GEF-4 Strategic Programme #4 on "Promoting Sustainable Energy Production from Biomass"

Executing Agency/Implementing Partner and other project partners: Ministry of Environment and Natural Resource Protection

TE members (international consultant and national consultant): Mr. Manfred Stockmayer (international consultant), Mrs. Kate Skhireli (national consultant)

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In particular, the TE Team would like to thank the PMU with Mr. Vakhtang Berishvili and Mrs. Natia Lipartiani for their patience in answering our questions; the Team of UNDP Georgia (Mrs. Natia Natsvilishvili – Assistant Deputy Representative and Mrs. Nino Antadze – Energy and Environment Team Leader) and the Regional Technical Advisor (Mr. John O'Brien) and Mr. Grigol Lazriev, MENRP, for their valuable contributions and comments helping us to get a detailed insight into the work carried out and the results achieved.

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ABBREVIATIONS

CEO	Chief Executive Officer
CO2	Carbon Dioxide
CTA	Chief Technical Advisor
EBRD	European Bank for Reconstruction and Development
EEC	Energy Efficiency Centre
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNASM	Georgian National Agency for Standards and Metrology
I	Interview
KfW	Kreditanstalt für Wiederaufbau
kW	Kilowatt
LR	Literature Review
MENRP	Ministry of Environment and Natural Resource Protection
M&E	Monitoring and Evaluation
Mtoe	Million tons of oil equivalent
MTR	Mid-Term Review
MW	Megawatt
NGO	Non-governmental organization
NOx	Nitrogen Oxide
NREAP	National Renewable Energy Action Plan
OFP	Operational Focal Point
PEB	Project Executive Board
PIF	Project Identification Form
PIR	Project Implementation Review
PIMS	Project Information Management System
PM	Particulate Matter
PMU	Project Management Unit
Prodoc	UNDP Project Document for “Promotion of Biomass Production and Utilization in Georgia”
Project	The project under review: “Promotion of Biomass Production and Utilization in Georgia”
PPG	Project Preparation Grant
RTA	Regional Technical Advisor
SEAP	Sustainable Energy Action Plan
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
tCO2eq	Tons of CO2 equivalent
TE	Terminal Evaluation
ToR	Terms of Reference
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
US$	US Dollar

1. EXECUTIVE SUMMARY

1.1 Project Information Table

Project Title	Promotion of Biomass Production and Utilization in Georgia		
UNDP Project ID (PIMS #):	4335	PIF Approval Date:	28.01.2010
GEF Project ID (PMIS #):	4157	CEO Endorsement Date:	28.01.2010
ATLAS Business Unit, Award # Proj. ID:	GEO10, 00061612, 00078116	Project Document (ProDoc) Signature Date (date project began):	10.06.2013
Country(ies):	Georgia	Date project manager hired:	01.10.2013
Region:		Inception Workshop date:	March- 2014
Focal Area:		Midterm Review completion date:	February 2016
GEF Focal Area Strategic Objective:		Planned closing date:	October 2017
Trust Fund [indicate GEF TF, LDCF, SCCF, NPIF]:	GEF	If revised, proposed op. closing date:	
Executing Agency/ Implementing Partner:	Ministry of Environment and Natural Resources Protection of Georgia		
Other execution partners:			
Project Financing	at CEO endorsement (US$)	at Terminal Evaluation (US$)*	
[1] GEF financing:	US$ 925,000	US$ 911,736	
[2] UNDP contribution:	US$ 155,000	US$ 144,608	
[3] Government:	US$ 3,000,000+ In-kind contributions US$ 300,000	US$ 102,000 In-kind contributions	
[4] Other partners:	Private sector US$ 1,000,000	Private sector US$ 124,000 grants, US$ 391,000 in-kind contributions	
[5] Total co-financing [2 + 3+ 4]:	US$ 4,455,000	US$ 761,608	
PROJECT TOTAL COSTS [1 + 5]	US$ 5,380,000	US$ 1,673,344	

1.2 Project Description

The objective of the project was to promote sustainable production and utilization of upgraded biomass fuels in heating applications in the municipal services sector of Georgia, to meet the sector's thermal energy needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions. To achieve this objective, a comprehensive strategy was proposed, including promotion of demand and supply of biomass and demonstration activities such as the launch of a pilot plant for making upgraded fuels from biomass waste, one that can be replicated throughout the country, as well as establishment of a two-component Investment Grant Mechanism to deliver pilot biomass supply- and demand-side projects.

The project was structured in four different Outcomes:

- Outcome 1: Enhanced policy and regulatory framework for promotion and efficient utilization of biomass energy in Georgia
- Outcome 2: Increased market confidence in the feasibility of production of upgraded biomass fuels and their utilization in municipal heating applications
- Outcome 3: Created local supply of and demand for upgraded biomass fuels
- Outcome 4: Improved knowledge and stakeholder capacities for bioenergy development and replication

The Project Goal was to generate GHG emission reductions of 7,000 tons by the end of the project and in the same time period to install a total capacity of at least 2 MW of biomass heating systems.

The Georgia Biomass Project was implemented by UNDP, the Executing Agency was the Ministry of Environment and Natural Resources Protection of Georgia (MENRP). Under this arrangement, UNDP assumed the overall management of the project under the direction of the Project Executive Board (PEB). The day-to-day management of the project has been carried out by a Project Management Unit (PMU) consisting of a full-time project manager and a part-time project assistant. For the last year and a half of the project, there was also support from an international CTA (Chief Technical Advisor), and for the last year of the project there was also support from a marketing and communications assistant.

1.3 Evaluation Rating Table

Specific ratings as per the terms of reference for the evaluation (see Annex 1) are summarized below:

Table 1: Evaluation Ratings Summary

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry	MS	Quality of UNDP Implementation	MS
M&E Plan Implementation	U	Quality of Execution - Executing Agency	MS
Overall quality of M&E	MU	Overall quality of Implementation / Execution	MS
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance	R	Financial resources:	MU
Effectiveness	MS	Socio-political:	L
Efficiency	MU	Institutional framework and governance:	ML
Overall Project Outcome Rating	MS	Environmental:	L
		Overall likelihood of sustainability:	ML

1.4 Summary of conclusions, recommendations and lessons

There are a number of corrective actions to be suggested based on the experience and lessons learnt of the Promotion of Biomass Production and Utilization in Georgia project. These are as follows:

1. Work in the project was based on a number of key assumptions in the ProDoc (financial viability of switching from biomass to natural gas, availability of biomass, requirements for biomass heating systems, for more details refer to the MTR Report). During the initial phase of the project it turned out that many of these assumptions were not correct. A more thorough review of key assumptions should be carried out.
2. The national implementing partner needs to be chosen carefully. This project might have been much stronger if it had been located in the Ministry of Energy, however, due to the lack of interest of the Ministry of Energy in the initial project phase, this would not have been an option.
3. ProDocs are usually written by consultants, who are then not involved in the implementation of the project. This leads – as in this project – to ProDocs which are generous in their deliverables and don't fully reflect the potential challenges when implementing the project – in this case the City of Tbilisi was added to the project document with an USD 3 million co-financing commitment when it was not clear that they would be able to contribute. This challenge can be overcome by a critical review of all assumptions during the inception phase and involving international experts in early stages of project implementation.

4. All co-financing statements given by private sector and municipalities during the preparation of the project fell through. There were certain caveats in the co-financing letters, such as making the commitments subject to favorable feasibility studies, which allowed the partners to withdraw their commitments. The quality and seriousness of co-financing commitments needs to be questioned and challenged during the project preparation phase and attention needs to be paid to making sure co-financing is as strong as possible and to the wording of co-financing commitments. A critical review of co-financing commitments needs to be carried out in the project inception phase.
5. In similar projects, there should be a strong focus on the inception phase especially if time has passed between ProDoc development and project start. The purpose of the inception phase is to set-up the project management system and to critically review the ProDoc with key stakeholders involved in the implementation of the project. Changes since project definition, new challenges or wrong assumptions should be critically investigated and – where necessary – considered in the activities under the project.
6. A clear work plan with timelines has to be elaborated during the inception phase. The ProDoc only included a budget by years, but no detailed description which actions should be carried out when. There were no further details on the work plan elaborated during the inception phase. This was a major hurdle in understanding whether the project is on track.
7. Project design and the M&E system should include interim targets and milestones, as these are helping project management in checking progress and taking steps of adaptive management, if necessary.
8. When the project was started, there was little experience in the country on the production and use of improved biomass. Over the first two years, only national experts were hired to support implementation of the project, no international expertise was used. It is recommended to use international experts especially in the start-up phase of similar projects to make sure correct decisions are being made.
9. It can be concluded that the money available for investment into pilot projects was too little. In order to make a serious impact and to investigate the viability of various kinds of improved biomass, a multiple of the funds for investment would have been necessary. Also, small changes in budget (shifting 100k from investments to consultants) have a high impact on funding available for investments (in this case minus 20%).

The project managed to produce a number of key outcomes, such as implementation of three pilot projects, elaboration of the Biomass Strategy, preparation of draft standards for improved biomass and biomass stoves and the registration of the Biomass Association. However, due to considerable delays in the first two years of the project, work is finishing now and there is no time to facilitate and guide the further implementation/use of outcomes produced. Therefore, there are a number of actions necessary to support progress towards the initial benefit from the project. These are as follows:

1. The Biomass Strategy is an important document for the promotion of biomass in Georgia. The main achievement of the strategy is that it was elaborated in a consultative process and was approved by all main stakeholders, including MENRP and Ministry of Energy. The shortcoming of the strategy is that it is more a list of potential actions rather than a detailed strategy and action plan about next steps The strategy only gives little indications about financial support mechanisms (it mentions for example the establishment of a revolving fund), but lacks information on funding requirements as well as concrete steps. During the on-site mission it became apparent that there is little likelihood to get the Biomass Strategy in its current format and content approved as both MENRP and Ministry of Energy don’t support the entire document, but only specific components (there was no clarity which these components are). UNDP is providing support to the Ministry of Energy in preparing the National Renewable Energy Action Plan (NREAP), a commitment under the Energy Community. Efforts should be

taken to make sure that a maximum of actions will be included in the NREAP, this would support the original target under the project of preparing a “National Bioenergy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Georgia”. Specifically, the NREAP should clearly elaborate on the financial support mechanisms to be put into operation, how they will work and how they will be financed (e.g. grant funding, revolving loan fund,…).

2. As mentioned several times in the Evaluation Report, on a governmental level no champion has taken full ownership of the further development of improved biomass. It is suggested that the MENRP takes a strong role in supporting the implementation of the outcomes of the project. MENRP is a key ministry due to its responsibility for climate changes issues, but also through the National Forest Agency, which is part of MENRP. The National Forest Agency is the key player in using wood residues from forests and also a key partner in the implementation of the pilot project with National Nursery.
3. The on-site mission and reports prepared by experts raised serious questions about the sustainability of the Greenergy pilot project. Currently, the project is out of operation due to internal issues and lack of economic viability and there are no short-term plans to restart production of wood briquettes based on wine prunings, the concept which was applied for in the grant competition. Greenergy plans to replace wine prunings by sawdust, as the drying of wine prunings (the company is using natural gas for that) proved to be too expensive. Part of the grant from GEF was used to purchase a wood chipper, which would have been used for cutting the wine prunings. As the chipper will not be used in the short-term (and there are question marks whether it will be used in the medium- or long-term), it should be investigated how the wood chipper can be used by other companies in Georgia with a need of chipping wood.
4. The pilot project with National Nursery is an important cornerstone for the concept of improved biomass in Georgia, as wood residues from forests are being used for the production of briquettes. However, the on-site mission and reports prepared by experts raised issues and the need for further support in delivery of raw material, technical management of the plant and marketing of the briquettes produced. It is necessary to provide additional support to the project in order to secure sustainability of the pilot. The Forestry Agency should play an active role in supporting the project in securing biomass resources for the production of briquettes. Additional funding from donors would be necessary to provide support in technical, management and marketing aspects.
5. The foundation and registration of the Biomass Association was an important step to create a mouthpiece for the entire sector. However, the project did not succeed in elaborating a sustainable business case for the Association, so there is a risk that the Association cannot become sustainable. As there is limited capacity and interest from the founding members to finance the operation of the Association, support in securing additional funding for the Association from international organizations and donors is recommended. Relatively small contributions from individual organizations and donors can add up to a sizeable budget, which could allow the Association to hire a full-time manager.
6. The Biomass Association is currently driven by individuals/companies. The Association should discuss and agree upon rules how financing received for projects could not only benefit individual members, but have a positive financial impact for the Association (for example by charging a management fee as percentage of funding received for using the name of the Association). Additionally, membership fees should be introduced at a low level with the aim of increasing these in steps over a number of years with the aim of securing a fixed income stream for the Association.
7. The standards developed under the project (covering Room Heaters Fired by Solid Fuel, Wooden Briquettes and Wooden Logs) have been sent to Georgian National Agency for

Standards and Metrology (GNASM) for checking and approval. In case there are issues or challenges arising, support should be given to make sure the standards are being approved.

8. A number of promotional materials (brochures, infographics, videos) were prepared under the project, both in Georgian and English. The Biomass Association should be motivated to use these materials, both on their website and as printed documents.

Based on the results, there are a number of proposals for future directions:

1. At a very early stage in the project, the use of woodchips has been discarded due to high production costs. There was a lengthy analysis in the MTR Report explaining why the basis for the decision was wrong. Woodchips should be re-considered as an important source, as they are easy to produce with only limited treatment (chipping) and no drying required. Woodchips can be mainly used in bigger buildings with a central heating system, there was a short feasibility study carried out by the international consultant to showcase how woodchips can be used in municipal buildings in Tbilisi.
2. The role of improved biomass in Georgia should be manifested in a prominent role in the NREAP to be developed over the next months, with the support from SIDA. UNDP is providing support to the Ministry of Energy in preparing the NREAP and efforts should be taken to make sure that a maximum of actions will be included in the NREAP. The NREAP should include financial or regulatory incentives to help promote biomass in Georgia.
3. Two out of the three pilot projects have an interesting potential for replication. The pilot project operated by Nisoni is already the second briquetting plant operated by the company (the first plant is located in Akhmeta) and shows that the company has the know-how and financial resources to set-up the production of improved biomass. The National Nursery plant in Akhmeta is interesting, as it is using forest residues. This as well as the background of the National Nursery and support by the National Forest Agency makes this project a good candidate for further replication in the country.
4. During the course of the project, studies were carried out to investigate the financial viability of improved biomass. A study on the three pilot projects showed that production of wood briquettes can be financially viable if sufficient raw material can be secured at a low price, there is good technical capacity to manage the production process and there is sufficient capacity to sell the products. The briquettes can then be used in improved stoves with manual feeding. The operators were able to sell the briquettes at around 500 GEL/ton (around USD 210/ton). In order to be profitable, production costs should be below 250 GEL/ton (around USD 105/ton), which only one project currently manages. The other two have production costs of more than 400 GEL/ton.
   A study carried out by the international biomass consultant showed that more sophisticated solutions, such as fully automated boilers with automatic feeding system for woodchips still require considerable grant support to be financially viable. The low gas price (USD 0.87/m³ or 2.8 USD Cents per kWh) only allows minor annual savings and results in a payback period of around 45 years for the biomass installation.
   Based on this information, it is important (as already mentioned above) to support the pilot projects (with specific focus on the National Nursery project) in technical, management and marketing aspects to make sure required sales prices can be achieved and production costs are as low as possible. Additionally, it is important to understand the need for further financial support of improved biomass projects when working on the NREAP.
5. There are a number of donors in the country (KfW, GIZ, SIDA, etc.), which were interested in the results of the project, as this has a link to current or potential future activities of these donors. One donor, SIDA, provided USD 150,000 to UNDP to develop a National Renewable Energy Action Plan (NREAP) for Georgia. Contacts with donors should be re-established to investigate

ways how to further support the extended use of improved biomass in Georgia as the commercial market for biomass is not yet there in Georgia and more donor support is required.

2. INTRODUCTION

2.1 Purpose of the evaluation

The “Promotion of Biomass Production and Utilization in Georgia” project (PIMS #4335) started in June 2013 and is now in its fourth year of implementation and scheduled to end in October 2017. The project has been designed to promote sustainable production and utilization of upgraded biomass fuels to meet the municipal services sector’s heating needs in Georgia in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions. The project has four major expected outcomes:

- Outcome 1: Enhanced policy and regulatory framework for promotion and efficient utilization of biomass energy in Georgia
- Outcome 2: Increased market confidence in the feasibility of production of upgraded biomass fuels and their utilization in municipal heating applications
- Outcome 3: Created local supply of and demand for upgraded biomass fuels
- Outcome 4: Improved knowledge and stakeholder capacities for bioenergy development and replication

The project aimed at facilitating a shift from fossil to biomass fuels by promoting the production and usage of upgraded biomass fuels in the municipal service sector. By the end of the project, a municipal biomass heating project had to be designed and implemented with upgraded biomass supplied by a private sector company. In addition to the funding from UNDP and GEF, sizeable co-funding from the Georgian government, the Tbilisi City Hall and private sector was envisaged at the beginning of the project.

The mid-term review of the project took place in autumn 2015 and concluded that the project faced a number of serious issues due to weaknesses in the project set-up, lack of participation of key stakeholders and delays in implementation of key components of the project. The grant competition, which was started in September 2015 was seen as a good adaptive measure. The review gave a number of recommendations how to improve performance of the project.

In accordance with UNDP and GEF requirements, the project is required to undertake a Terminal Evaluation (TE) now at the end of its project lifetime. The objectives of the TE are to assess the achievement of project results, to assess the extent to which the project has successfully carried out adaptive management following the mid-term review, to promote accountability and transparency, to provide feedback on issues that are recurrent across the UNDP portfolio and need attention, to contribute to the overall assessment of results in achieving GEF strategic objectives aimed at global environmental benefits and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of future UNDP programming.

2.2 Scope and Methodology

The TE is undertaken in line and accordance with the guidance provided in “UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects”. In terms of scope, the TE covers all aspects of the development and implementation of the Project, from the preparation of the PIF up till and including the Terminal Evaluation Mission (September 2017) and will include inputs to activities, to outputs, outcomes and impacts.

The rating scale applied in this project is consistent with the UNDP Guidance for Conducting Terminal Evaluations of UNDP supported, GEF-financed projects, and is summarized in the table below.

Table 2: Rating Scales

Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution	***Sustainability ratings:***	***Relevance ratings***
6: Highly Satisfactory (HS): no shortcomings 5: Satisfactory (S): minor shortcomings 4: Moderately Satisfactory (MS) 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major problems 1. Highly Unsatisfactory (HU): severe problems	4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML):moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	2. Relevant (R) 1. Not relevant (NR) ***Impact Ratings:*** 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
Additional ratings where relevant: Not Applicable (N/A), Unable to Assess (U/A		

2.3 Structure of the Terminal Evaluation Report

The structure of the evaluation report follows the “Evaluation Report Outline” presented in Annex F of the ToR of the assignment with some minor modifications. The Executive Summary is providing a quick overview on the main project results, ratings, other observations and recommendations for further work.

3. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

3.1 Project start and duration

The Project Document was signed by the Georgian government on 10 June 2013. Work on the project effectively started in October 2013. The project end date according to the ProDoc is (December) 2016, which seems to be a mistake as the duration of the project is 4 years. The end date was revised to 31 October 2017. The project end date in Atlas is 31 December 2017.

3.2 Problems that the project sought to address

There are a number of barriers that hinder the development of a local biomass energy market in Georgia and which the project sought to address. These can be generally categorized as supply-side and demand-side barriers. On the supply side, the key barriers are scarcity and unreliability of the biomass feedstock data, as well as high spatial dispersion of relative small-size biomass stocks. On the demand side, the key barriers are the competition with other sources of energy (like firewood or natural gas), as well as relatively high upfront costs of advanced biomass heating systems.

A critical barrier that is applicable to both supply and demand side is a lack of equity to go into projects which makes it more difficult to secure debt finance for project developers. The setup of the project offered a comprehensive response strategy that was designed to remove the identified barriers in a targeted manner with a main focus on removing the financing barrier by establishing a two-component Investment Grant Mechanism. Some of the main barriers to sustainable development and utilization of upgraded biofuels identified during the project preparation phase were:

- Lack of reliable and comprehensive biomass feedstock data
- Lack of a biomass strategy
- Competition with other energy resources
- Low awareness of biomass energy technologies and related benefits
- Limited local technical capacity
- High upfront investment costs and lack of affordable financing

3.3 Immediate and development objectives of the project

The development objective of the UNDP project “Promotion of Biomass Production and Utilization in Georgia” was to promote sustainable production and utilization of upgraded biomass fuels in heating applications in the municipal services sector of Georgia, to meet the sector’s thermal energy needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions.

The immediate objectives of the project were to install at least 2 MW of improved heating systems, substituting fossil fuel-based heating in municipal buildings. These heating systems were supposed to lead to GHG emission reductions of 7,000 tCO2eq during the lifetime of the project.

3.4 Baseline Indicators established

The baseline indicators at GEF outcome level included GHG emission reductions, achieved during project lifetime, from project-supported installation and operation of biomass boilers and installed

capacity of incremental biomass heating systems, substituting fossil fuel-based heating, supported by the project. The indicators defined in the ProDoc focused on Tbilisi. However, during the Mid-term evaluation it was decided that – due to the withdrawal of the City of Tbilisi – the work under the project will extend to entire Georgia. Therefore, also the indicators will measure achievements in entire Georgia.

3.5 Main stakeholders

According to the Project Document, the main project stakeholders included:

- Ministry of Environment and Natural Resources Protection: the key function is to support sustainable development of the country. The ministry elaborates and implements state policy, programs, strategy of environmental protection for sustainable development, national environmental action programs and management plans; implements public administration (regulation, licensing, registration, supervision and control) on natural resource usage, waste management, chemical, nuclear and radiation safety
- Ministry of Energy: elaborates and coordinates the state energy policy and promotes environmental protection of all energy activities and optimally incorporates environmental protection goals in the formulation and implementation of energy programs.
- Ministry of Regional Development and Infrastructure elaborates and coordinates implementation of the regional development policy and programs of socioeconomic development.
- The Ministry of Economy and Sustainable Development implements the national economic development strategy to ensure sustainable economic development based on stable macroeconomic policy and private entrepreneurship development.
- Tbilisi City Municipality: signatory to the Covenant of Mayors with an obligation to reduce GHG emissions in the city by 20% by 2020 against the 2005 level. Along with measures to improve the efficiency of energy use, the municipality is readily interested in substituting fossil fuels in the city's energy mix with renewable energy, including biomass.
- Private sector: companies like D&V Ltd., Georgian Wood and Industrial Development Co. Ltd., Georgian Coal Ltd. or Dioskuria Ltd. are active in biomass as forestry operators, briquette producers or sawmill operators.
- International financing institutions: institutions such as EBRD or KfW have a focus on providing financing for renewable energy projects in Georgia.

After project start, there were changes to the list of key stakeholders. Despite repeated efforts and a strong co-financing commitment by Tbilisi City Municipality, no project has been identified or implemented in Tbilisi in the first two years of the project. Initially, the city of Tbilisi insisted on a comprehensive feasibility study on biomass before they could take a final decision on their USD 3 million co-financing commitment. After the feasibility study came out, the City of Tbilisi was not able to confirm any co-financing commitment but still wanted to remain a partner of the project. Finally, the MTR recommended stopping working with Tbilisi City Hall meaning that for more than 2 years the City of Tbilisi was the main co-financing partner of the project but nothing happened in terms of their development or implementation of municipal biomass heating projects.

All private sector participants included in the ProDoc pulled out of the project soon after project start and were replaced with new private sector participants identified in the grant competition launched in autumn 2015.

3.6 Expected Results

At project inception, the expected results were as follows:

- Outcome 1: Enhanced policy and regulatory framework for promotion and efficient utilization of biomass energy in Georgia
    - Output 1.1: Bioenergy strategy and action plan
    - Output 1.2: Quality standards for upgraded biomass fuels and biomass heating systems
- Outcome 2: Increased market confidence in the feasibility of production of upgraded biomass fuels and their utilization in municipal heating applications
    - Output 2.1: Completed investment-grade feasibility study and business plan for a biomass upgrading plant in Tbilisi
    - Output 2.2: Completed feasibility studies for installing at least 10 biomass boilers in Tbilisi municipal facilities
    - Output 2.3: Dedicated bioenergy financing mechanism in the KfW Renewable Energy Fund and/or other facilities
- Outcome 3: Created local supply of and demand for upgraded biomass fuels
    - Output 3.1: Executed Investment Grant Mechanism
    - Output 3.2: Commissioned and operational pilot biomass upgrading plant in Tbilisi
    - Output 3.3: At least 10 installed and operational pilot biomass-based heating systems in Tbilisi
- Outcome 4: Improved knowledge and stakeholder capacities for bioenergy development and replication
    - Output 4.1: Set of targeted promotional materials on sustainable production and utilization of upgraded biomass fuels
    - Output 4.2 Established Bioenergy Association of Georgia
    - Output 4.3 At least 2 replication bioenergy projects identified and under development
    - Output 4.4: Completed project monitoring and evaluation

During the Mid-Term Review the outputs related to Tbilisi (Outputs 2.1, 2.2 and 3.2) were modified and extended to entire Georgia.

4. FINDINGS

4.1 Project Design/Formulation

Analysis of LFA/Results Framework (Project logic /strategy; Indicators)

Project logic/strategy and indicators are discussed below in chapter "Feedback from M&E activities used for adaptive management".

Assumptions and risks

The ProDoc was based on a number of assumptions which proved not correct in early stages of project implementation. These assumptions were discussed in length in the MTR Report and are summarized here below.

- The project design focused on the City of Tbilisi (as a last minute addition to the project after the private company Ferrero withdrew its co-financing letter) who offered a letter with USD 3 million of co-financing, subject to favorable feasibility study. About 18 months after project start it turned out that there is not enough volume of biomass around the City of Tbilisi and the interest of the City government was limited.
- Challenges and the economics of switching from natural gas to biomass were not considered in project design, nor the fact that the Government has a national strategy to promote universal coverage of gas.
- Specific requirements for biomass heating systems dependent on type of biomass used were not considered in project design.
- Lack of guidance on what type of biomass should be used under which circumstances was missing.
- Too optimistic assumptions when it comes to financial viability of switching from biomass to natural gas were made and lack of financial modeling.

All these issues, which were not considered in the project setup, have put the project in a very difficult starting position and can to a certain extent explain the delays the project has experienced in the initial phase, but cannot explain why there hasn't been more focus and effort on overcoming issues in later phases of the project (up to the MTR).

A risk analysis was provided in the project document, the following risks were identified during the project preparation phase in the Offline Risk Log:

Table 3: Assessment of Envisioned Risks

#	Description	Impact & Probability	Countermeasures / Mgt response
1	Biomass feedstock (wood resides, hazelnut shells) price growth due to increased competition from alternative uses of biomass waste	I – high P – medium	Realistic assessment of feedstock prices in the first place when designing biomass upgrading plant; Long-term feedstock supply arrangements (e.g. from forest concessions)
2	Unreliable biomass feedstock supply for the pilot biomass upgrading plant	I – medium P – medium	Careful sourcing of feedstock, including identification of alternative supply options within economically-justifiable distance from Tbilisi; Entrance into long-term business arrangements (e.g. consortium) with feedstock suppliers;

			Right-sizing the biomass upgrading facility to the lowest guaranteed supply of biomass, which is to be done as part of the full-scale feasibility study
3	Eventual investment into biomass energy from private or public sector not forthcoming	I – high P – medium	The project-financed Investment Grant Mechanism will be a key factor in mitigating this risk by providing investment subsidies to cover up to 30% of pilot projects' investment costs; A thorough analysis of the entire spectrum of aspects related to the pilot upgrading plant and biomass boilers (production, organizational and financial structure, costs and revenues) as part the investment-grade feasibility studies, ensuring a return on investment acceptable to the investors
4	Lack of relevant support from the local and central Governments	I – medium P – low	Ministry of Environment and Natural Resources Protection to play a leading role in "lobbying" the project within the government and pushing the relevant decisions, particularly as part of preparation of the national biomass strategy and action plan, and facilitation of decision by the key government entities (Ministry of Energy and Ministry of Finance) on requesting a biomass funding window as part of KfW's REF

The issues the project faced during its implementation showed that the project risks were properly identified in the ProDoc. Lack of biomass resources, lack of financial attractiveness of investments into biomass projects and lack of commitment from private and municipal partners proved as real hurdles to the project.

As already pointed out in various chapters in the MTR Report, there would have been better opportunities in managing the risks associated with the project. Some examples are:

- The approval process of the project took almost three years from the first draft of the Project Document to the signing of the ProDoc. This is an unusually long time for project preparation with a risk that framework conditions for the project are changing. Despite this fact, there was no review of risks and assumptions at project start.
- There was a focus on one main co-financier (Tbilisi City Hall) and there was neither an analysis of the risk associated with such a focus nor ideas about a plan B if work with the City of Tbilisi is not proceeding as planned.
- It took almost 2 years for the project to stop trying to work with Tbilisi City Hall and undertake adaptive management and choose alternative pilot demonstration projects.
- Studies showed that availability of biomass – especially around Tbilisi – was less than expected. Studies only focused on briquetting and did not consider woodchips.
- Although the Ministry of Energy has been identified as a key stakeholder, there was little involvement of the Ministry in the project up to the MTR. Earlier involvement of the Ministry would have helped in the implementation of a number of activities, mainly the Biomass Strategy.

Lessons from other relevant projects incorporated into project design

The ProDoc mentions a number of related past and ongoing activities in Georgia:

- KfW REF, UNDP-GEF Renewable Energy project

- USAID Winrock Rural Energy Program
- EBRD EE/REs loan facility
- AgriGeorgia afforestation project
- Rehabilitation of Degraded Landscapes, GIZ

However, it is not clear whether and how these projects were incorporated into the project design. The majority of these projects (KfW/GEF, USAID and EBRD) are focusing either on small hydro power or energy efficiency and therefore not really relevant for biomass. It would have been helpful to look at biomass-related projects in the region and the experience from the EU and incorporate lessons learnt from these projects into project design. There are a number of UNDP projects in the region to learn from[1] as well as various activities of The World Bank and EBRD in Central and Eastern Europe[2].

Planned stakeholder participation

The ProDoc correctly identified in chapter 1.3 the main stakeholders for the implementation of the project in Georgia (for the list of stakeholders refer to chapter 3.5). The document also describes consultations to be held with stakeholders under different activities, such as development of Bioenergy Strategy, development of dedicated bioenergy financing mechanism or formation of Bioenergy Association. As mentioned above, the ProDoc also identified the lack of relevant support from the local and central Governments as a key risk factor and suggested countermeasures (identification of key stakeholders to promote project and facilitation of decisions in government).

Replication approach

The replication approach of the project was based on the attractiveness of the pilot projects to be implemented under the project. The ProDoc referred to biomass resources of around 130,000 tons in Georgia, a feedstock which could easily sustain a number of small- to medium-scale biomass upgrading plants that could cost-effectively produce woodchips, briquettes or pellets both for domestic consumption and for export. There are more than 200 facilities (schools, kindergartens,…) managed by the City of Tbilisi, which could have usee the upgraded biomass as a source for heating. Additionally, the project document included the design and implementation of promotional activities for bioenergy, including printed and electronic materials, videos, and web-based articles.

The replication approach chosen can be evaluated as adequate. Due to the lack of experience in the country with upgraded biomass, successfully implemented pilot projects are an important pillar for further successful usage of biomass resources. Promotional activities help to inform potential investors and users about the benefits of biomass use.

UNDP Comparative Advantage

While UNDP's comparative advantage was not specifically mentioned in the initial proposal presented to the GEF, its experience in implementing similar projects in the region as well as the existence of a country office in Georgia represented an important advantage.

[1] For example "Reducing Greenhouse Gas Emissions through the Use of Biomass Energy in Northwest Slovakia", "Development and Commercialization of Bioenergy Technologies in the Municipal Sector in Ukraine", "Reducing Barriers to accelerate Development of Biomass Markets in Serbia".

[2] For example "Renewable Energy and Regional Development Project" in Hungary and "Sustainable Energy GEF Project" in FYROM.

Linkages between project and other interventions within the sector

As mentioned in chapter 1753534918.19894928 there were a number of activities in the country, which had linkages to the project. Additionally, the European Bank for Reconstruction and Development (EBRD), as part of its current country strategy for Georgia, has specifically prioritized promotion of energy efficiency and renewable energy and had a US$ 35 million credit line established in Georgia that helped finance energy efficiency and renewable energy (including biomass) investments. The possibility to work more closely with the EBRD was not explored in detail.

Tbilisi City Municipality as a signatory to the Covenant of Mayors has an obligation to reduce GHG emissions in the city by 20% by 2020 against the 2005 level. As part of the agreement, the city had drafted a Sustainable Energy Action Plan (SEAP) that defined concrete GHG reduction measures together with time frames and assigned responsibilities which translate the long-term emission reduction strategy into action. The SEAP for Tbilisi mentioned biomass energy as one option for reducing GHG missions. Along with measures to improve the efficiency of energy use, the municipality was interested in substituting fossil fuels in the city's energy mix with renewable energy, including biomass.

Management arrangements

The Georgia Biomass Project is being implemented by UNDP, the Executing Agency is the Ministry of Environment and Natural Resources Protection of Georgia (MENRP). Under this arrangement, UNDP assumes the overall management of the project under the direction of the Project Executive Board (PEB). The day-to-day management of the project has been carried out by a Project Management Unit (PMU) consisting of a full-time project manager and a part-time project assistant. The office of the PMU is located in the premises of the MENRP.

The task of the PEB was to monitor project progress, guide its implementation and support the project in achieving its listed outputs and outcomes. The Project Board was planned to be chaired by the MEPNR and was supposed to include representatives of UNDP, Tbilisi Municipality and representatives of private sector. Other members (e.g. KfW, GiZ, USAID etc.) were planned to be invited at the decision of the Project Board on an as-needed basis.

It was planned that the Project Manager is supported by short-term international and national experts taking the lead in the implementation of the specific technical assistance components of the project. Contacts with experts and institutions in other countries that have already gained more experience in implementing bioenergy projects, related policies and financial support measures were planned to be established.

The figure below shows the project organisation structure.

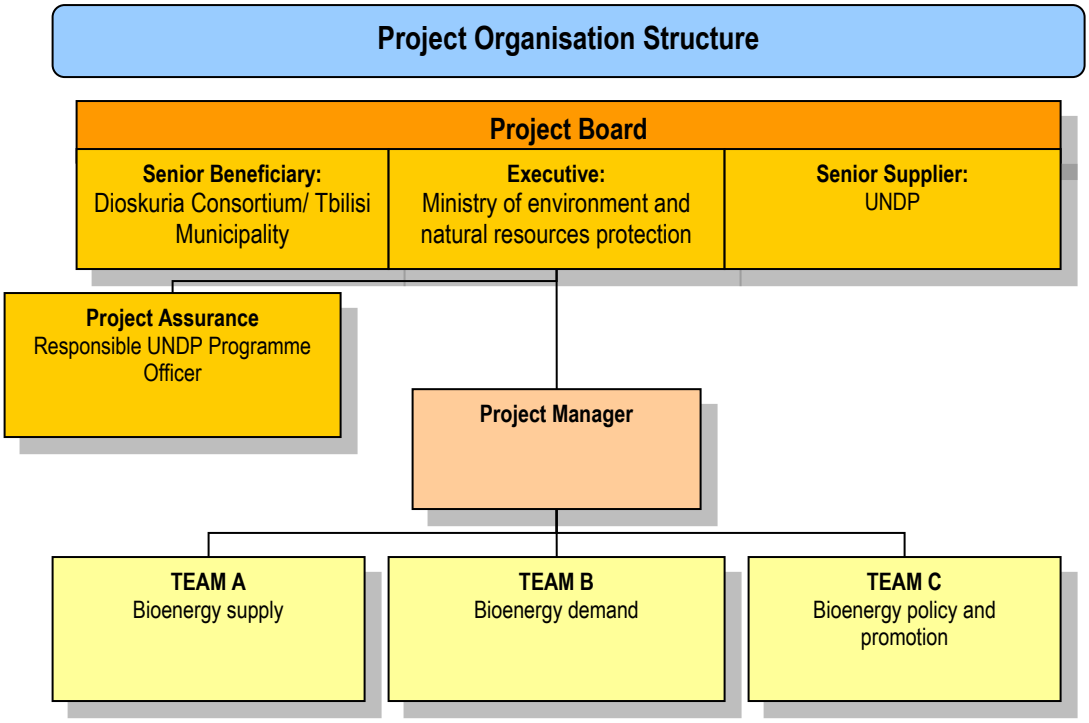


Figure 1: Project Organisation Structure

Whereas the identification of key stakeholders was correct, the setup of the project management did not fully reflect the results of the stakeholder analysis. Key stakeholders such as the Ministry of Energy, the Ministry of Agriculture or the National Forestry Agency were not included in the Project Board (it was only mentioned that other participants than the members of the Project Board can be invited at the decision of the Project Board on case-by-case basis).

The Inception Workshop, which was supposed to be held within the first 2 months of the project, should have discussed the issue of responsibilities of the Project Board and roles of stakeholders in the Project Board. As noted during the MTR, a specific Inception Workshop was not held, the 2015 PIR it was mentioned that the first PEB meeting is considered as the Inception Workshop.

During the first PEB Meeting it was suggested to involve additional key stakeholders in the project. Ministry of Energy, Ministry of Agriculture and National Forestry Agency were mentioned specifically. However, despite repeated efforts, the Ministry of Energy only joined PEB meetings after the MTR.

4.2 Project implementation

Adaptive management, incl. changes to the project design and project outputs during implementation

As explained in detail in the MTR, there were a number of flaws in the original project design, which required adaptive management from project start onwards. Additional issues coming up during project implementation, required further measures. The main adaptive management steps were as follows:

- There was a wrong understanding in what biomass can achieve as the project originally aimed at switching from natural gas to biomass. Based on the progressive extension of the natural gas network in Georgia and taking into account that improved biomass was taking only infant steps, there was a need to reorient. The new focus was on avoiding the switch from traditional biomass (log wood) to natural gas by providing access to improved biomass. As a consequence, project outputs were modified. During the implementation of the project it was confirmed that this was a correct step, as a number of municipalities selected as partners in pilot projects switched to natural gas before improved biomass stoves could be delivered to municipal buildings.
- The initial project concept had a full focus on the City of Tbilisi. Due to the lack of interest of the City of Tbilisi (which also led to losing more than 80 percent of the committed co-funding), the project was re-oriented to cover the entire country of Georgia.
- Due to the lack of interest of the City of Tbilisi on the one side and the lack of private sector players originally envisaged as partners in the project (with companies even going bankrupt), a project competition was introduced as an adaptive measure.
- As part of the project, a Biomass Strategy was developed. During preparation of the study it became clear, that an adoption of the Strategy as a stand-alone document will not be likely. Therefore, UNDP took the initiative to secure external funding to support the Ministry of Energy in developing the National Renewable Energy Action Plan (NREAP), a document which is required under the Energy Community and which – as per agreement between the Ministry of Energy and UNDP/MENRP – will integrate the Biomass Strategy.
- During the implementation of one of the pilot projects, a major legal barrier was identified. Based on legislation at that time it was not allowed to collect wood residues from forests in Georgia. UNDP worked with the Ministry of Environment and the National Forest Agency to amend the relevant regulation and made sure that there is progress in the implementation of the pilot project. In February 2017, the law was modified and now allows the National Forest Agency to tender the cleaning of forests under the condition that the residues removed from forest are being used for the production of upgraded biomass.

These measures of adaptive management were important for improving the performance of the project and increasing the quality of outputs.

Partnership arrangements (with relevant stakeholders involved in the country/region)

The PEB met six times during the project term (March 2014, March 2015, December 2015, May 2016, December 2016 and June 2017). In the first meeting of the PEB (where only UNDP, MENRP, City of Tbilisi and one NGO participated), it was suggested to add other stakeholders, such as Ministry of Energy, Ministry of Agriculture and Forestry Agency. However, no representatives of these institutions took part in the second PEB in March 2015 or the third meeting in December 2015.

The MTR Report recommended adding key stakeholders such as the Ministry of Energy, Ministry of Agriculture, Forestry Agency and private sector representatives to the PEB meetings. Some additional

government representatives participated in the fourth and fifth meeting, there were no additional participants in the last meeting.

In addition to the PEB meetings, four stakeholder meetings were held between March 2016 and April 2017. Private sector, NGOs as well as representatives from key government institutions participated in these meetings chaired by UNDP. The meetings were used to discuss several outcomes of the project (standards, Biomass Strategy, etc.), in each meeting between 25 and 40 stakeholders participated.

As suggested in the ProDoc, there were contacts with experts and institutions in other countries that have already gained experience in bioenergy projects. The PMU has met with representatives of bioenergy projects in Serbia, Azerbaijan, Moldova, Belarus and Ukraine to exchange experience. In addition, contacts with business representatives from Lithuania, Czech Republic and Finland were established.

Feedback from M&E activities used for adaptive management

The key recommendations of the project's mid-term review conducted end of 2015 included the following:

Recommendation 1: improve participation of key stakeholders in project.
There were two separate steps taken in increasing the participation of stakeholders.

1. The Ministry of Energy, National Forestry Agency and Ministry of Agriculture were added as members of the PEB and also participated in some of the meetings.
2. To involve private sector and NGOs, separate stakeholder meetings were organized, four meetings were held between March 2016 and April 2017. In these meetings, representatives from key government institutions participated as well, the meetings were led by UNDP. The meetings were used to discuss several outcomes of the project (standards, Biomass Strategy, etc.).

Recommendation 2: improve project management and develop detailed work plan with clearly defined activities and timelines.
After the MTR, a revised workplan was prepared covering the period until end of project. The workplan included activities necessary for all four Outcomes as well as accompanying activities such as preparation of ToR, tender procedures or contracting. There were regular reviews of the workplan by UNDP to make sure timelines are met.

Recommendation 3: intensify guidance by Project Executive Board (PEB).
A revised workplan was presented to PEB in the first meeting after the MTR and got approved by the Board. There is no indication from the minutes of meetings that the workplan was reviewed in the following PEB meetings.

The recommendation to send preparatory information (actual version of work plan indicating progress on the various tasks, studies/documents finalized, etc.) was not implemented. During PEB meetings, only a few slides were presented summarizing the main work tasks and giving an overview on the budget.

Despite recommending improving the quality of the PEB minutes, this was not implemented. The minutes are still very difficult to read as they mainly just reflect statements of participants, rather than focusing on summarizing decisions, next activities, responsibilities and timelines. Also, it is not clear

from the minutes which stakeholders were invited to the PEB meetings, as the minutes only list the participants.

Recommendation 4: stop work with Tbilisi City Hall on identification of pilot projects.
Work with Tbilisi City Hall was stopped, the project was extended to explore possibilities to support biomass demo projects in the entire Georgia.

Recommendation 5: intensify work with partners and stakeholders working on energy efficiency in municipalities.
Although work was carried out with partners working on energy efficiency and with municipalities, there was no additional effort to look at energy efficiency of buildings. This is an important aspect and should be considered in future efforts to use improved biomass in Georgia.

Recommendation 6: strengthen capacity by contracting an international biomass expert.
The project hired an International Biomass Expert to support implementation of various tasks under the project. The consultant carried out 3 missions (July 2016, October/November 2016 and May 2017) and was very helpful in supporting the project in elaborating the Biomass Strategy, the various standards and setting up the Biomass Association. Additionally, the international consultant gave detailed comments on the three pilot projects and prepared separate reports with recommendations for each of these projects. Whereas the support was seen as very positively by the stakeholders involved although his limited availability was criticized. Dissemination of the findings was inadequate, mission reports and reports on pilot projects were sent to PMU, however, these reports were not further disseminated (consultants involved in working with pilot projects or pilot projects themselves).

Recommendation 7: elaborate and apply criteria for shortlisting and selecting proposals in grant competition and ***Recommendation 8: further process with projects in grant competition.***
The implementation of the grant competition overlapped with the preparation of the MTR, therefore the recommendations were applied in the process.

Summing up, the majority of recommendations provided in the MTR were followed, which helped the project in improving the performance in the second half of the project term. Deficiencies were detected in project management, which are covered in the section on Monitoring and Evaluation.

Project Finance

The following table gives an overview on the project budget and expenditures from project start in June 2013 to project end in October 2017. At the time of the Terminal Evaluation (September 2017), only US$ 23,656 were not spent yet and were planned to be spent until end of project.

Table 4: Total Project Budget and Expenditures (in US$)

Outcome	2013	2014	2015	2016	2017	Total expenditure
Outcome 1: Enhanced policy and regulatory framework	6,499	31,306	11,107	25,460	12,207	86,580
Outcome 2: Increased market confidence	1,928	25,144	9,803	4,724	14,542	56,141
Outcome 3: Created local supply of and demand	-	56,667	349,143	246,213	-139	651,884

Outcome 4: Improved knowledge and stakeholder capacities	5,618	13,816	34,874	38,791	36,037	129,135
Project Management	14,184	60,179	48,090	2,770	31,037	156,260
Total	28,229	187,112	453,017	317,957	93,685	1,080,000
Total (Cumulative)	28,229	215,342	668,358	986,315	1,080,000	

The following table shows the project expenditures by budget lines and compares plan and actual. It can be seen that deviations in the major categories are acceptable.

Table 5: Project expenditures by budget lines (in US$)

	Plan	Actual	Deviation
International Consultants	75,000.00	68,911.73	-8.1%
Local consultants	78,000.00	72,779.12	-6.7%
Contractual services – individuals	213,200.00	189,033.84	-11.3%
Contractual services – companies	114,500.00	101,662.62	-11.2%
Grant	558,000.00	601,481.24	7.8%
Direct Project Costs - GOE	0.00	1,779.20	0.0%
Direct Project Cost-Staff	0.00	4,284.27	0.0%
Communication	2,600.00	3,118.23	19.9%
Office supplies	2,000.00	1,697.40	-15.1%
Travel	18,100.00	13,816.53	-23.7%
Miscellaneous	2,000.00	3,486.08	74.3%
Equipment and Furniture	2,600.00	2,438.87	-6.2%
Professional services	4,000.00	3,029.80	-24.3%
Printing and publication costs	10,000.00	12,481.07	24.8%
Total	**1,080,000.00**	**1,080,000.00**	**0.0%**

There was slow progress of the Project in the beginning which was reflected in the slow rate of expenditure during the first 2 years, in which only 29.3% of the overall budget (US$ 1.08 million) was spent. The original plan in the ProDoc was to have the main part of expenditure for investments in year 2, which did not take place as planned. Investments then took place end of 2015 and beginning of 2016, which is reflected in the high expenditure in these 2 years.

When looking at individual budget lines (e.g. international consultants, national consultants, travel,…) there are only small deviations between ProDoc and actual expenditures, which is a good result for a project where the ProDoc was developed already 7 years ago. This indicates that there was good and tight financial management.

The only bigger deviation was on money spent for investments. The ProDoc foresaw investments of US$ 558,000, whereas actual investments were only US$ 454,600. This is due to the pilot project competition, which was started as an adaptive management after the envisaged biomass demonstration projects with the City of Tbilisi fell apart. There was a need to manage the pilot process as well as to support the implementation of the pilot projects, which required additional sources.

During the preparation phase, the project has received co-financing commitments from UNDP, the Georgian Ministry of Environment and private sector, totaling US$ 4.455 million. The following table gives an overview on co-financing commitments at project start.

Table 6: Co-financing at project start

Sources of Co-financing	Name of Co-financer	Type of Co-financing	Amount Confirmed at CEO endorsement (US$)
Local Government	Tbilisi Municipality	Grant	US$ 3,000,000
Private Sector	Georgian Coal	Grant + In-Kind	US$ 300,000
Private Sector	D&V	Grant	US$ 500,000
Private Sector	Dioscuria	Grant	US$ 400,000
GEF Partner Agency	UNDP	Grant	US$ 155,000
National Government	MENRP	In-Kind	US$ 100,000
		TOTAL	US$ 4,455,000

Apart from the co-financing commitment of UNDP and MENRP[3], all other co-financing (provided by private sector) has fallen through. Co-funding was partly replaced by private sector co-funding for the pilot projects. Co-financing provided from private sector is as follows:

Table 7: Co-financing by project

Company	In-kind contribution company	Cash contribution company	Cash contribution municipalities	Total co-financing
Nisoni	US$ 72,000	US$ 67,000	US$ 1,542	US$ 140,542
Greenergy	US$ 205,944	US$ 36,000	US$ 925	US$ 242,869
Nursery	US$ 113,0004	US$ 20,700	-	US$ 133,700
Total	US$ 390,944	US$ 123,700	US$ 2,467	US$ 571,111

The following table summarizes planned and actual co-funding.

Table 8: Planned and actual co-financing

Co-financing (type/source)	UNDP own financing (mill. US$)		Government, municipalities (mill. US$)		Private Sector (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants	0.155	0.155	3.000	0.002	1.200	0.124	4.355	0.281
In-kind support			0.100	0.100		0.391	0.100	0.491
Totals	0.155	0.155	3.100	0.102	1.200	0.515	4.455	0.772

Actual co-financing provided is only 17.3% of envisaged co-financing. Whereas original co-financing commitments were almost fully grant/cash contributions (there was only US$ 0.1 million in-kind contribution by MENRP), actual grant/cash contributions are only about a third of total co-financing, the rest is in-kind contributions.

[3] There is no exact quantification of the co-financing provided by MENRP. As MENRP provided the promised in-kind contribution (office, internet, etc.), it is assumed that the co-financing commitment is met.

[4] The report on the Nursery project claimed that a drone used for locating biomass residues is an in-kind contribution. Discussions with the National Forest Agency clarified that the drone is not exclusively available for Nursery, but also used by other entities. Therefore, the value of the drone (US$ 23,000) was deducted from the in-kind contribution claimed.

Whereas the overall level of co-financing is disappointing, two observations can be made:

- At the mid-term review, total co-financing was expected to reach a level of US$ 495,000. Co-financing at end of the project is now US$ 772,000, which is an increase of more than 50% compared to the expected level.
- As all co-financing commitments (except of UNDP and MENRP) fell apart more or less immediately after project start, the quality and seriousness of these commitments needs to be questioned.

Monitoring and evaluation: design at the entry and implementation (*)[5]

The project's Monitoring and Evaluation (M&E) system consist of the indicators and outputs of the project's results framework. The M&E system also included annual Project Implementation Reviews (PIRs) and the project Mid-Term Review as well as monitoring of project progress in PEB meetings.

The MTR concluded that the indicators are in general adequate, but some modifications were recommended (revised wording for the Project Objective indicator – removing the reference to fossil-fuel based heating – and applying all indicators and targets to the entire country instead of only Tbilisi). Some shortcomings were noted, as there were no milestones and almost all indicators are 'yes or no' indicators, which makes monitoring challenging. The Monitoring and Evaluation design at entry can be considered as **Moderately Satisfactory (MS)**.

There was no system of monitoring of the Project Goal (7,000 tons of CO2 emission reduction achieved during project lifetime) and the Project Objective (2 MW installed capacity of incremental biomass heating system) throughout the project. At the time of the on-site mission, the Project Manager could not present consistent figures for these two main indicators and it was unclear whether or not Goal and Objective were achieved. There was no system in place to calculate these indicators and the Project Manager referred to consultants providing results after the pilot projects are implemented. In addition, there was also a lack of understanding how these indicators should have been used in project management to steer the project. The project manager argued that all activities were implemented on a best-efforts basis and information about the indicators would not have helped in changing results, which manifests a lack of understanding of project management.

A review of responses in PIRs as well as discussions held with the PMU during the on-site mission show that evaluation of performance was in many cases not done towards achieving a specific target level under an Outcome, but by evaluating whether work was carried out or not, independent whether work contributed in achieving a specific target. There are examples where progress was evaluated at 100% as work was done as per the ProDoc even if the objectives were not reached at all.

Additionally, discussions during the on-site mission showed that there are cases where the project manager selectively picks or neglects commitments mentioned in the ProDoc without given conclusive argumentation.

By taking into account all of the above, the rating for project's monitoring and evaluation is considered as **Unsatisfactory (U)**.

[5] In addition to a descriptive assessment, all criteria marked with (*) must be rated using a six-point rating scale: 6: Highly Satisfactory (HS), 5: Satisfactory (S), 4: Marginally Satisfactory (MS), 3: Marginally Unsatisfactory (MU), 2: Unsatisfactory (U) and 1: Highly Unsatisfactory (HU)

UNDP and Implementing Partner implementation/execution(*), co-ordination and operational issues

As mentioned in the section on Project Design, participants in the first Project Executive Board (PEB) meetings mainly included UNDP and MENRP. Additionally, representatives from Tbilisi City Hall and some NGOs were present. Only after the Mid-Term Review, participants from the Ministry of Energy and the National Forestry Agency joined.

As described in the section Management Arrangements, the PMU was designated to manage day-to-day operation including PEB meetings. Despite recommendations given during the MTR, the quality of meeting preparation as well as summarizing findings and decisions has not improved since the MTR. There is no clear indication that relevant information and reports were regularly shared with the PEB members before meetings in order to give the members the opportunity to prepare for the PEB. The minutes of the PEB meetings are very general and it is difficult to condense results of discussions held during the meetings and decisions taken.

During the on-site mission, interviews with all PEB members were held. There was a general notion that more success and better results were expected. The results of the project are seen as helpful in pushing biomass energy in Georgia, however, none of the stakeholders was (fully) satisfied with project success. When interpreting these statements, the following needs to be taken into consideration.

- While being the Implementing Partner, MENRP is only one of the ministries dealing with biomass energy in Georgia. Ministry of Energy, Ministry of Economy and National Forest Agency are equally important, in some instances even more important than MENRP. It takes the effort and strong contribution of all players to improve the role of upgraded biomass in Georgia and during the on-site mission the Evaluation Team got the impression that this full commitment was lacking from the other Ministries and stakeholders.
- The Ministry of Energy was not actively involved in the project, despite being the key Ministry in Georgia responsible for the development of energy policy. In the views of some stakeholders, the greater involvement of the Ministry of Energy , including as National Implementing Partner might have been very helpful to improve the chances of success of the project.
- The PMU one the one hand suffered from the suboptimal project design, which was evaluated and discussed in length in the MTR. On the other hand, the performance of the PMU was evaluated as unsatisfactory at the MTR and despite delivery of a number of key deliverables during the last 12 months, there still would have been a lot of room for improvement.

By taking into account all of the above, the rating for project's implementation/execution is considered as **Moderately Satisfactory (MS).**

4.3 Results

Overall results (attainment of project objectives) (*)

The following table gives a detailed analysis of Project Goal, Project Objective and Project Outcomes. It describes the status reached at the end of the project, gives a rating as well as a justification of the rating. The result of this detailed analysis is the Overall Project Outcome Rating.

Table 9: Progress towards Results Matrix

Project Strategy	Indicator	Baseline Level	End-of-project Target	End-of-project Status	Rating	Justification for Rating
Project Goal: To reduce GHG emissions associated with thermal energy use in municipal service sector in Georgia	GHG emission reductions, achieved during project lifetime, from project-supported installation and operation of biomass boilers in Tbilisi	Zero	7,000 tons CO2eq	The stoves installed under the project (see Objective below) were installed in 2017 and as the heating season hasn't started, no emission reductions were generated during project lifetime by using improved biomass in these stoves. By June 2017 the total volume of briquettes sold by the 3 pilot companies was around 550 tons. This equals a CO2 emission reduction of around 475 tons of CO2eq.	MU	The CO2 emission reduction achieved is less than 10% of the original target, which is highly unsatisfactory. The rating of MU is given to the project, as the difficult project start with weak commitments from project partners and co-financiers led to huge delays. The project competition was started end of 2015, which left too little time to generate emission reductions during the project lifetime. It is realistic that Nisoni sells around 1,200 tons of briquettes per year, which is 50% of the business plan. If National Nursery achieves the same percentage, total output would be 1,880 tons per year. Over 20 years, this would lead to an emission reduction of around 26,500 tons of CO2. This is around 55% of the original target of 47,872 tons.
Objective: To promote sustainable production and utilization of upgraded biomass fuels in heating applications in the municipal services sector of Georgia, to meet the sector's thermal energy needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions.	Installed capacity of incremental biomass heating systems, substituting fossil fuel-based heating, supported by the project	Zero	At least 2 MW	The project supported the installation of energy efficient ovens in municipalities. Stoves were installed as follows: • National Nursery: 21 stoves with capacity of 7-8 kW (on average 7.5 kW), in total 157.5 kW • Nisoni: 8 stoves with capacity of 7 kW each, 27 stoves with capacity of 7.5 kW each, in total 258.5 kW • Greenergy: 25 stoves with capacity of 5 kW each, in total 125 kW Total installed capacity is 541 kW or 0.5 MW	MU	The project managed to reach only 27 per cent of the original target of at least 2 MW installed capacity, which is not satisfactory. The rating of MU is given as the project applied adaptive management measures and started the pilot project competition, which lead to the installation of 81 small energy efficient stoves in municipalities, which will use the briquettes produced in production line co-financed by the project.

Outcome 1: Enhanced policy and regulatory framework for promotion and efficient utilization of biomass energy in Georgia	Availability of long-term vision for bioenergy development in Georgia	No long-term vision for bioenergy sector in Georgia	National Bioenergy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Georgia	The development of the National Bioenergy Strategy was based on a participative project, including all major stakeholders in Georgia (including ministries, NGOs, private sector, etc.). The strategy was elaborated by a local consultant with inputs from an international biomass expert and was agreed with all stakeholders. The National Bioenergy Strategy will be used as an input in the Renewable Energy Action Plan, which is going to be developed by the Ministry of Energy with support from UNDP over the next months.	S	The National Biomass Strategy is an important document for pushing the use of improved biomass in Georgia and is based on wide stakeholder participation. UNDP has correctly identified that the strategy (or parts of the strategy) should be included in the overarching Renewable Energy Action Plan (REAP) to improve likelihood of uptake of actions listed in the Strategy. Whereas the strategy is more a list of potential actions without defining financial support mechanisms, the REAP should clearly elaborate which financial support mechanisms have to be put into operation, how they will work and how they will be financed. Work on the strategy should have started earlier to allow stronger embedding in discussions on governmental level.

	Share of upgraded biomass fuels on the Georgian market that meet the national quality standards	No standards	Quality standards for upgraded biomass fuels and biomass heating systems are in place At least 30% of upgraded biomass fuels meeting the standards	A number of quality standards (room heaters fired with solid fuels; wooden briquettes; wooden logs) were created with the support of local expert, reviewed by Project's international Biomass Expert and agreed with all major stakeholders. Standards were developed based on the European standards taking into account Georgian circumstances and have been submitted to the Georgian National Agency for Standards and Metrology (GNASM) for approval.	S	The standards developed meet the requirements defined in the ProDoc. There is a deviation, as based on recommendation by the international consultant, a standard for wooden logs was created instead of standards for wood chips and pellets, as this standard should cover the biggest part of current biomass consumption. Although this is correct, it would be important to have a standard for wood chips as well, as wood chips have a high potential. It is confirmed by local consultants that both the efficient stoves installed in municipalities and the briquettes produced by the pilot projects meet the draft standards. Due to late start of work on the standards, approval of standards during the term of the project was not possible.
	Availability of detailed information on the amount and location of biomass in Georgia	Biomass information scarce and unreliable	Detailed inventory of available biomass resources with update mechanisms in place Established biomass monitoring system	A detailed inventory of available woody and agriculture biomass in Georgia is completed.	HS	The national biomass inventory is a well-prepared document and overcomes an important barrier (lack of reliable and comprehensive biomass feedstock data). The study was done as a field study with extensive efforts and is essential for the further development of upgraded biomass in Georgia, as it gives an overview on the volumes and locations of various types of biomass which can serve as raw materials for the production of upgraded biomass.

Outcome 2: Increased market confidence in the feasibility of production of upgraded biomass fuels and their utilization in municipal heating applications	Status of investors' decision to co-finance a biomass upgrading plants	Preliminary co-financing agreements made	Investors closed financing as per pilot plants business plan	Agreements with investors to setup three pilot productions on producing wood briquettes (National Nursery, Nisoni, Greenergy) were finalized.	MS	Work with the City of Tbilisi hasn't led to any countable results yet, therefore process was replaced by grant competition for entire Georgia, which led to selecting the 3 pilot plants. Grant competition is a good adaptive measure, but could have started earlier. Agreements with investors financing the pilot projects were signed, which meets the required outcome. However, the co-funding provided by the pilot projects is considerably lower than envisaged in the ProDoc and grant contribution from investors has been replaced to a large extent by in-kind contributions.
	Status of Municipalities decision to co-finance installation of 10 biomass boilers heating systems in municipal buildings	Preliminary co-financing agreements made	Municipalities closed financing for the pilot boilers installation business plan	Municipalities, that participated in pilot projects purchased and installed energy efficient ovens for municipal buildings (mainly schools and kindergartens). Municipalities include Marneuli (35 ovens), Sagarejo (25 ovens), Dedoplistskaro (3 ovens) and Akhmeta (18 ovens).	HS	Stoves purchased for municipalities are all meeting the draft standard for room heaters developed under this Project and are either from local production in Georgia or imported from Turkey. During the process of supplying stoves to the municipalities, some municipalities withdrew their commitment as access to natural gas became available. Project Team managed to find replacement for these municipalities.

	Status of a dedicated funding window for bioenergy projects in Georgia	No dedicated funding window available	Dedicated funding window for bioenergy projects fully agreed with KfW (or other facility) and operational	A study on "Access to Finance for Biomass Energy Projects" was finalized in November 2015, providing an extensive overview on potential funding opportunities. Some efforts were made to secure funding for biomass projects, however, no dedicated funding window for bioenergy projects was developed under this project.	U	Whereas it is confirmed that KfW did not have the possibility to include biomass in their renewable funding window, and although there were limited opportunities, these should have been pursued more actively. Suggestions of how to establish a funding window could have been elaborated to summarize the ideas and concepts the Project Team had. With the increase in the interest in biomass, which was seen towards in the final stages of the project, these concepts could have been good suggestions for implementation of a funding window under the Biomass Strategy.
Outcome 3: Created local supply of and demand for upgraded biomass fuels	Status of Investment Grant Mechanism	No mechanism	Operational criteria agreed with relevant stakeholders and investment grants released	Three pilot productions were identified and investment grants were released.	MS	Three pilot installations were established and put into operation. Grant funding provided by Project is as per the result of the project competition. However, there are serious issues with the operation of 2 of the pilot projects, as various problems arouse, which were not identified in the business plan (technical issues, management issues, sales and marketing issues). There is further support necessary in solving technical issues, management issues and sales and marketing issues to make sure these pilot projects are sustainable.
	Biomass upgrading plant	No biomass upgrading plant	Biomass upgrading plant launched and operational	See line above	MS	See line above.

	Number of municipal buildings operating new biomass boilers using upgraded biomass fuels	Zero	At least 10 biomass boilers using biomass installed and in operation	A total of 81 improved wood stoves were installed in municipalities, using briquettes to provide heat to kindergartens and schools. This includes Marneuli (35 ovens), Sagarejo (25 ovens), Dedoplistskaro (3 ovens) and Akhmeta (18 ovens).	HS	Stoves purchased for municipalities are all meeting the draft standard for room heaters developed under this Project and are either from local production in Georgia or imported from Turkey. During the process of supplying stoves to the municipalities, some municipalities withdrew their commitment as access to natural gas became available. Project Team managed to find replacement for these municipalities.
Outcome 4: Improved knowledge and stakeholder capacities for bioenergy development and replication	Status of Bioenergy Association of Georgia	No formal vehicle for bioenergy stakeholder interaction	Established Bioenergy Association of Georgia with a sustainable business plan which is able to continue operations after the project ends	The Biomass Association is established and registered. The association includes biomass fuel producers, heating equipment vendors, and civil society organizations. The Association prepared a number of project proposals and has received a first grant funding for the implementation of project on promotion of sustainable biomass fuels in two municipalities.	MS	Setting up and registering the Association was a challenging process due to various interests among members as well as a lack of understanding among potential members of the benefits an association can bring. Downside is that there is no sustainable business model and the association is currently depending on input of some private sector participants as well as in-kind contributions from NGOs. As the Association is further developing, it needs to find a good balance between allowing individual member to drive the development and being a spokesperson for all members covered by the Association. Also, there should be focus to have an updated website, as this is for many people the first contact to biomass or the Association.

	Number of new bioenergy projects initiated in Georgia	No bioenergy projects, insufficient capacities	At least 2 new bioenergy projects designed with financial closure and construction initiated	This Output is obsolete due to the redefinition of the focus from Tbilisi towards entire Georgia.	Not applicable	This Output is obsolete due to the redefinition of the focus from Tbilisi towards entire Georgia.

Based on the detailed analysis above, the Overall Project Outcome Rating can be considered as **Moderately Satisfactory (MS).**

Relevance (*)

The work the project carried out and the outcomes delivered are very relevant for the country for a number of reasons:

- The project helped in overcoming a legal barrier in collecting wood residues from forests. This is an important basis for further increasing production of briquettes based on wood residues.
- Biomass is the main source of energy for heating in rural areas. The outcomes of the project support a more sustainable use of biomass resources.
- As a member of the Energy Community, Georgia needs to prepare a National Renewable Energy Action Plan. The work done for the Biomass Strategy is an important input for that plan.
- The standards prepared under the project are relevant for the country and can be applied in the future.

It can be concluded that the project was relevant for Georgia, which was also confirmed by all stakeholders interviewed during the on-site mission. By taking into account all of the above, the rating for relevance is **Relevant (R).**

Effectiveness and Efficiency (*)

Project effectiveness evaluates to which extent an objective has been achieved or how likely it is to be achieved. The evaluation of project results in chapter “Overall results” gives detailed ratings for the Project Goal, the Project Objective and each of the Outcomes. **As such, the Moderately Satisfactory rating (MS) is restated for project effectiveness.**

Project efficiency evaluates the extent to which results have been delivered with the least costly resources possible. As described in chapter “Project Finance”, all project funds have been used as described in the ProDoc and there are only small deviations between ProDoc and actual expenditures, which is good for a project where the ProDoc was developed already 7 years ago. This indicates that there was good and tight financial management.

As an action of adaptive management, the pilot project competition was started in 2015, which led to awarding investment grants to three companies in early 2016. For the management of the project competition, funds needed to be reshuffled from the category investment grant to consultants, as UNDP was not allowed to directly contract with private sector participants. Through this shift, the money available for investment grants was reduced by about 20%.

Compared to the ProDoc, the level of co-financing provided was only US$ 772,000, 17.3% of the envisaged US$ 4.5 million. None of the private sector co-financing commitments made before project start realized, the co-financing of City Tbilisi fell through soon after the project start. The quality and seriousness of these commitments needs to be questioned and can be attributed to lack of quality in project preparation. Co-financing was replaced mainly by in-kind contributions, only about one third of co-funding was provided in cash.

The project managed to secure co-financing from private sector despite all commitments made before project start fell through. Although this is a positive development, the project only was able to generate a small part of the original co-financing. The original ratio between grant funding provided by

GEF/UNDP (US$ 1.08 million) and original co-financing (US$ 4.5 million) was around 1:4. At project end, the ration has gone down to 1:0.7. This has to be seen in connection with project goals and objectives, which have been clearly missed. Based on this, the rating for efficiency of the project is **Moderately Unsatisfactory (MU)**.

Country Ownership

The original objective of the project was to "*promote sustainable production and utilization of upgraded biomass fuels in heating applications in the municipal services sector of Georgia, to meet the sector's thermal energy needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions.*"

Biomass is a cross-sectional topic and for a project on improved biomass to be successful, a number of players with different responsibilities need to actively contribute. In Georgia, Ministry of Environment and Natural Resource Protection, Ministry of Energy, Ministry of Agriculture, Ministry of Economy and National Forest Agency are the main stakeholders on the government level. In the first two years of the project, only MENRP in their role as Implementing Agency actively participated in the project. After the MTR, there were increased and successful efforts by the PMU to get other government stakeholders (Ministry of Energy, Ministry of Agriculture, Forestry Agency) on board for the PEB and stakeholder meetings. There was intensive work in various stakeholder meetings on key outcomes, such as the Biomass Strategy with its Action Plan. Additionally, there was tailwind by Georgia joining the Energy Community, which increased the interest of government players in improved biomass.

Whereas key stakeholders seem to be positive that improved biomass should play a more important role in Georgia's energy sector, there seem to be differences in the understanding which exact role biomass should play and how this should be achieved. Also, the question of who is leading the development seems to be not clear and no champion has taken over command. The Biomass Strategy was successfully developed and agreed among stakeholders (including all key government stakeholders), however, it is unclear, whether the Strategy or which parts of the Strategy will be adopted by the government.

The meetings with key government stakeholders during the terminal evaluation gave the impression of a certain lack of country ownership. This is reflected by the fact that in the final PEB meeting only representatives from UNDP and MENRP participated, no other government partner was present. The fact that the Ministry of Energy was not actively involved in the project is an issue that may have prevented the project from being more successful.

When comparing the situation between project start and project end, there is a positive development though. Improved biomass is on the agenda, but stronger action needs to be taken to make a real impact. Increased country ownership can be shown by taking up the Biomass Strategy developed under the project and integrating it in the National Renewable Energy Action Plan (NREAP), a process which will be led by the Ministry of Energy with support by UNDP.

Mainstreaming

The United Nations Development Assistance Framework (UNDAF) for Georgia for 2011 – 2015 defined three main outcomes to set the direction of UN system development assistance for the years 2011 – 2015, including:

- Poverty Reduction, aims to advance inclusive development, employment creation and access to health, education and essential social services, especially for vulnerable groups.
- Democratic Development, aims to promote balanced, independent, fair and participatory governance systems and processes at all levels, based on the Rule of Law, human rights and equality principles.
- Disaster Risk Reduction, aims to build up Georgia's resilience to disasters through prevention and minimizing damage and loss in case of emergencies.

Biomass contributes to creating income generating opportunities in rural areas, thereby assisting in alleviating poverty. The pilot projects implemented under the program will directly provide 25 new workplaces in rural areas as well as in Tbilisi. A further uptake of improved biomass (e.g. through the modification of the forestry law, which allows the collection of wood from forests) will provide further opportunities to contribute to that outcome.

In regards to gender equality, project design as well as project implementation were focused on entities (municipalities, private companies, etc.) rather than individuals. As such, there were no significant gender concerns considered in the design of this project.

Sustainability (*)

For sustainability, the GEF guidelines establish four areas for considering risks to sustainability, each of which should be separately evaluated and then rated as to the likelihood and extent that they will impede sustainability of the project outcomes. These risks include:

- Financial risks
- Socio-economic risks
- Institutional framework and governance risks
- Environmental risks

There are key **financial risks** to the sustainability of the outcomes of the project. The Biomass Strategy has been finalized and includes an Action Plan with a long list of activities to be implemented. The Strategy also includes cost estimates for implementing the actions, but there seems to be no provision in current budgets to cover these costs. This either means a delay in implementation or the need to collect donor money for the implementation of actions.

Out of the three pilot projects implemented, only one project is currently in a position to produce good volumes of improved biomass at relatively low costs, which should provide a stable financial basis for further operation. One project needs further assistance in securing input material, technical management of operation and sales. The third project has a very low likelihood to produce a sizeable output in the short to medium term.

In the final stages of the project, two studies were carried out to analyse the feasibility of biomass in Georgia. The first study investigated the three pilot projects and – as mentioned above – came to the conclusion that only one project (Nisoni) is currently feasible. The following table compares key factors of the various projects, both based on the business plan the companies presented and actual data.

Based on the information from the business plans, all 3 projects were financially attractive with simple payback periods between 3 and 5 years. Based on actual figures, the situation looks different.

For the Nisoni project the calculation confirms that the project is financially attractive, despite the fact that production volume is only around half of what was projected. Even without grant contributions, the investment in the factory has a payback period of less than 3 years.

The other 2 projects have 2 main issues : production costs are too high (around 70% higher than at Nisoni) and sales are minimal. This leads to extremely long payback periods, in the case of Nursery no payback period could be calculated as there were no sales.

The price achieved currently (500 GEL/ton of briquettes, confirmed by producers) is a good price, but there is a risk that prices might go down in the future. At sales prices of 400 GEL/t both Greenergy and Nursery would be negative as revenues would be below costs. Nisoni would have a payback period of 4.4 years, which is still decent.

All figures in GEL	**Nisoni**	**Greenergy**	**Nursery**
Total investment	864,690	832,260	774,800
Business Plan			
Sales price per ton	320	445	312
Costs per ton	206	178	197
Profit per ton	114	267	115
Annual production (t)	2,304	900	1,360
Annual profit	262,656	240,300	156,400
Payback period (y)	**3.3**	**3.5**	**5.0**
Actual situation			
Sales price per ton	500	550	N/A
Costs per ton	250	415	424
Profit per ton	250	135	N/A
Annual production (t)	1,200	23	Zero
Annual profit	300,000	3,065	N/A
Payback period (y)	**2.9**	**271.6**	**N/A**

On the consumer side (schools and kindergartens) stoves with a capacity of around 7kW were installed. Assuming 100 days of full operation with 6 hours per day, each stove would consume 0.86 tons per year, annual costs would be 429 GEL. Natural gas, which comes to around 95% from Azerbaijan and is heavily subsidised, is currently sold at a price of € 24/MWh. With this price operation costs are 234 GEL per year, clearly below the cost of briquettes (the calculation only considers operation costs and no investment costs, which are clearly higher for natural gas systems). This confirms the need of further financial support for the production of briquettes.

The second study, carried out by the international biomass expert, looked at the costs of an automatic wood chip heating system compared to natural gas. The system would include a boiler of 500 kW capacity, a fuel storage and an automatic feeding system. Total investment costs were estimated at € 550,000. Annual running costs on biomass were calculated at € 48,000, the costs of supply with natural gas are € 60,000. This gives a simple payback period of around 45 years, again due to the subsidised gas price in Georgia.

The foundation of the Biomass Association was an important milestone, as it can be the mouthpiece of a new sector. However, there is no clear strategy or business plan on how to generate income for

the Association and therefore make sure it can exist and further develop its membership base and activities. Overall, financial sustainability is considered as **Moderately Unlikely (MU)**.

There is a good level of awareness about the benefits of using wood residues for production of improved biomass, both for forests and for consumers such as municipalities and households in rural areas. From a socio-economic point of view there is no barrier using the outcomes of the project, therefore s**ocio-economic** sustainability is considered as **Likely (L)**.

There has been progress during the term of the project in the **institutional framework**, for example through modification of the legal framework to allow using residues from forests for the production of upgraded biomass or modifications in the legal operational framework for National Nursery to allow the production and sale of improved biomass. The Ministry of Energy is progressing with the elaboration of the National Renewable Energy Action Plan, which should be a good place for the Biomass Strategy developed under the project.

There is a certain risk in the institutional framework due to the fact that biomass is a cross-sectoral topic and a number of ministries play a major role. As no champion has taken full ownership of the further development of improved biomass, the sustainability of the institutional framework and governance is considered as **Moderately Likely (ML)**.

There is no **environmental risk** to sustainability since the project is designed to reduce the use of fire wood or fossil fuels such as natural gas by using upgraded biofuels. Moreover, in certain regions of Georgia, there is a considerable component of non-renewable biomass (up to 55%), a switch from fire wood to upgraded biofuels is a positive contribution. Therefore, environmental sustainability is considered as **Likely (L)**.

Based on the four ratings, the overall rating on the likelihood of sustainability is considered as **Moderately Likely (ML)**.

Impact

The project had a good impact on the situation of improved biomass in Georgia. Compared to the situation at project start, biomass is now on the agenda of the majority of stakeholders and – although commitment and ownership could be stronger – there is a considerable likelihood that the role of improved biomass will further increase. The project delivered a Biomass Strategy, which should be main component of the NREAP. Standards both for fuels and biomass stoves were developed, which are currently in the process of being checked and registered. A Biomass Association was founded, which has the potential to grow and can be the mouthpiece for the sector. All these outcomes are very relevant for the country and would not be there without the project. Therefore, impact is rated as **Significant (S)**.

5. CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNT

5.1 Summary of Ratings

The ratings given are summarized in Table 10 below.

Table 10: Evaluation Ratings

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry	MS	Quality of UNDP Implementation	MS
M&E Plan Implementation	U	Quality of Execution - Executing Agency	MS
Overall quality of M&E	MU	Overall quality of Implementation / Execution	MS
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance	R	Financial resources:	MU
Effectiveness	MS	Socio-political:	L
Efficiency	MU	Institutional framework and governance:	ML
Overall Project Outcome Rating	MS	Environmental:	L
		Overall likelihood of sustainability:	ML

5.2 Corrective actions for the design, implementation and M&E of similar future projects

There are a number of corrective actions to be suggested based on the experience and lessons learnt of the Promotion of Biomass Production and Utilization in Georgia project. These are as follows:

1. Work in the project was based on a number of key assumptions in the ProDoc (financial viability of switching from biomass to natural gas, availability of biomass, requirements for biomass heating systems, for more details refer to the MTR Report). During the initial phase of the project it turned out that many of these assumptions were not correct. A more thorough review of key assumptions should be carried out.
2. The national implementing partner needs to be chosen carefully. This project might have been much stronger if it had been located in the Ministry of Energy, however, due to the lack of interest of the Ministry of Energy in the initial project phase, this would not have been an option.
3. ProDocs are usually written by consultants, who are then not involved in the implementation of the project. This leads – as in this project – to ProDocs which are generous in their deliverables and don't fully reflect the potential challenges when implementing the project – in this case the City of Tbilisi was added to the project document with an USD 3 million co-financing commitment when it was not clear that they would be able to contribute. This challenge can be overcome by a critical review of all assumptions during the inception phase and involving international experts in early stages of project implementation.
4. All co-financing statements given by private sector and municipalities during the preparation of the project fell through. There were certain caveats in the co-financing letters, such as making the commitments subject to favorable feasibility studies, which allowed the partners to withdraw their commitments. The quality and seriousness of co-financing commitments needs to be questioned and challenged during the project preparation phase and attention needs to be paid to making sure co-financing is as strong as possible and to the wording of co-financing

commitments. A critical review of co-financing commitments needs to be carried out in the project inception phase.

5. As mentioned in previous comments, there should be a strong focus on the inception phase especially if time has passed between ProDoc development and project start. The purpose of the inception phase is to set-up the project management system and to critically review the ProDoc with key stakeholders involved in the implementation of the project. Changes since project definition, new challenges or wrong assumptions should be critically investigated and – where necessary – considered in the activities under the project.
6. A clear work plan with timelines has to be elaborated during project preparation phase. In the Georgia Biomass project, there was only a budget by years, but no detailed description which actions should be carried out when. This was a major hurdle in understanding whether the project is on track.
7. Project design and the M&E system should include interim targets and milestones, as these are helping project management in checking progress and taking steps of adaptive management, if necessary.
8. When the project was started, there was little experience in the country on the production and use of improved biomass. Over the first two years, only national experts were hired to support implementation of the project, no international expertise was used. It is recommended to use international experts especially in the start-up phase of similar projects to make sure correct decisions are being made.
9. It can be concluded that the money available for investment into pilot projects was too little. In order to make a serious impact and to investigate the viability of various kinds of improved biomass, a multiple of the funds for investment would have been necessary. Also, small changes in budget (shifting 100k from investments to consultants) have a high impact on funding available for investments (in this case minus 20%).

5.3 Actions to follow up or reinforce initial benefits from the project

The project managed to produce a number of key outcomes, such as implementation of three pilot projects, elaboration of the Biomass Strategy, preparation of draft standards for improved biomass and biomass stoves and the registration of the Biomass Association. However, due to considerable delays in the first two years of the project, work is finishing now and there is no time to facilitate and guide the further implementation/use of outcomes produced. Therefore, there are a number of actions necessary to support progress towards the initial benefit from the project. These are as follows:

1. The Biomass Strategy is an important document for the promotion of biomass in Georgia. The main achievement of the strategy is that it was elaborated in a consultative process and was approved by all main stakeholders, including MENRP and Ministry of Energy. The shortcoming of the strategy is that it is more a list of potential actions rather than a detailed strategy and action plan about next steps The strategy only gives little indications about financial support mechanisms (it mentions for example the establishment of a revolving fund), but lacks information on funding requirements as well as concrete steps. During the on-site mission it became apparent that there is little likelihood to get the Biomass Strategy in its current format and content approved as both MENRP and Ministry of Energy don't support the entire document, but only specific components (there was no clarity which these components are). UNDP is providing support to the Ministry of Energy in preparing the National Renewable Energy Action Plan (NREAP), a commitment under the Energy Community. Efforts should be taken to make sure that a maximum of actions will be included in the NREAP, this would support the original target under the project of preparing a "National Bioenergy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Georgia". Specifically, the NREAP should clearly elaborate on the financial support

mechanisms to be put into operation, how they will work and how they will be financed (e.g. grant funding, revolving loan fund,…).

2. As mentioned several times in the Evaluation Report, on a governmental level no champion has taken full ownership of the further development of improved biomass. It is suggested that the MENRP takes a strong role in supporting the implementation of the outcomes of the project. MENRP is a key ministry due to its responsibility for climate changes issues, but also through the National Forest Agency, which is part of MENRP. The National Forest Agency is the key player in using wood residues from forests and also a key partner in the implementation of the pilot project with National Nursery.
3. The on-site mission and reports prepared by experts raised serious questions about the sustainability of the Greenergy pilot project. Currently, the project is out of operation due to internal issues and there are no short-term plans to restart production of wood briquettes based on wine prunings, the concept which was applied for in the grant competition. Greenergy plans to replace wine prunings by sawdust, as the drying of wine prunings (the company is using natural gas for that) proved to be too expensive. Part of the grant from GEF was used to purchase a wood chipper, which would have been used for cutting the wine prunings. As the chipper will not be used in the short-term (and there are question marks whether it will be used in the medium- or long-term), it should be investigated how the wood chipper can be used by other companies in Georgia with a need of chipping wood.
4. The pilot project with National Nursery is an important cornerstone for the concept of improved biomass in Georgia, as wood residues from forests are being used for the production of briquettes. However, the on-site mission and reports prepared by experts raised issues and the need for further support in delivery of raw material, technical management of the plant and marketing of the briquettes produced. It is necessary to provide additional support to the project in order to secure sustainability of the pilot. The Forestry Agency should play an active role in supporting the project in securing biomass resources for the production of briquettes. Additional funding from donors would be necessary to provide support in technical, management and marketing aspects.
5. The foundation and registration of the Biomass Association was an important step to create a mouthpiece for the entire sector. However, the project did not succeed in elaborating a sustainable business case for the Association, so there is a risk that the Association cannot become sustainable. As there is limited capacity and interest from the founding members to finance the operation of the Association, support in securing additional funding for the Association from international organizations and donors is recommended. Relatively small contributions from individual organizations and donors can add up to a sizeable budget, which could allow the Association to hire a full-time manager.
6. The Biomass Association is currently driven by individuals/companies. The Association should discuss and agree upon rules how financing received for projects could not only benefit individual members, but have a positive financial impact for the Association (for example by charging a management fee as percentage of funding received for using the name of the Association). Additionally, membership fees should be introduced at a low level with the aim of increasing these in steps over a number of years with the aim of securing a fixed income stream for the Association.
7. The standards developed under the project (covering Room Heaters Fired by Solid Fuel, Wooden Briquettes and Wooden Logs) have been sent to Georgian National Agency for Standards and Metrology (GNASM) for checking and approval. In case there are issues or challenges arising, support should be given to make sure the standards are being approved.
8. A number of promotional materials (brochures, infographics, videos) were prepared under the project, both in Georgian and English. The Biomass Association should be motivated to use these materials, both on their website and as printed documents.

5.4 Proposals for future directions underlining main objectives

Based on the results, there are a number of proposals for future directions:

1. At a very early stage in the project, the use of woodchips has been discarded due to high production costs. There was a lengthy analysis in the MTR Report explaining why the basis for the decision was wrong. Woodchips should be re-considered as an important source, as they are easy to produce with only limited treatment (chipping) and no drying required. Woodchips can be mainly used in bigger buildings with a central heating system, there was a short feasibility study carried out by the international consultant to showcase how woodchips can be used in municipal buildings in Tbilisi.
2. The role of improved biomass in Georgia should be manifested in a prominent role in the NREAP to be developed over the next months, with the support from SIDA. UNDP is providing support to the Ministry of Energy in preparing the NREAP and efforts should be taken to make sure that a maximum of actions will be included in the NREAP. The NREAP should include financial or regulatory incentives to help promote biomass in Georgia.
3. Two out of the three pilot projects have an interesting potential for replication. The pilot project operated by Nisoni is already the second briquetting plant operated by the company (the first plant is located in Akhmeta) and shows that the company has the know-how and financial resources to set-up the production of improved biomass. The National Nursery plant in Akhmeta is interesting, as it is using forest residues. This as well as the background of the National Nursery and support by the National Forest Agency make this project a good candidate for further replication in the country.
4. During the course of the project, studies were carried out to investigate the financial viability of improved biomass. A study on the three pilot projects showed that production of wood briquettes can be financially viable if sufficient raw material can be secured at a low price, there is good technical capacity to manage the production process and there is sufficient capacity to sell the products. The briquettes can then be used in improved stoves with manual feeding. The operators were able to sell the briquettes at around 500 GEL/ton (around USD 210/ton). In order to be profitable, production costs should be below 250 GEL/ton (around USD 105/ton), which only one project currently manages. The other two have production costs of more than 400 GEL/ton.
   A study carried out by the international biomass consultant showed that more sophisticated solutions, such as fully automated boilers with automatic feeding system for woodchips still require considerable grant support to be financially viable. The low gas price (USD 0.87/m³ or 2.8 USD Cents per kWh) only allows minor annual savings and results in a payback period of around 45 years for the biomass installation.
   Based on this information, it is important (as already mentioned above) to support the pilot projects (with specific focus on the National Nursery project) in technical, management and marketing aspects to make sure required sales prices can be achieved and production costs are as low as possible. Additionally, it is important to understand the need for further financial support of improved biomass projects when working on the NREAP.
5. There are a number of donors in the country, (KfW, GIZ, SIDA etc …) which were interested in the results of the project, as this has a link to current or potential future activities of these donors. One donor, SIDA, provided USD 150,000 to UNDP to develop a National Renewable Energy Action Plan (NREAP) for Georgia. Contacts with donors should be re-established to investigate ways how to further support the extended use of improved biomass in Georgia as the commercial market for biomass is not yet there in Georgia and more donor support is required.

6. ANNEXES

6.1 TE ToR (excluding ToR annexes)

Terminal Evaluation Terms of Reference

Project name: Biomass Production and Utilization in Georgia

Post title: International Consultant for the Final Evaluation (FE) of full-sized UNDP-GEF project

Type of contract: Individual Contract (IC)

Assignment type: International Consultant

Country / Duty Station: Home Based Consultancy with one (1) mission of seven (7) working days (with Up to 9 travel days) to Georgia

Expected places of travel (if applicable): Tbilisi, Georgia and field trips to pilot projects outside Tbilisi (field trips outside Tbilisi does not envisage overnights)

Languages required: English

Starting date of assignment: 1st July 2017

Duration of Contract: 1st July – 31st October 2017

Duration of Assignment: 20 working days (with Up to 9 travel days out of which 7 should be working days spent in Georgia)

Administrative arrangements: UNDP Georgia will provide administrative and logistical support while traveling to Georgia (including transportation outside Tbilisi in field trips).

Evaluation method: Desk review with validation interview

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for the Terminal Evaluation (TE) of the Promotion of Biomass Production and Utilization in Georgia (PIMS #4335.) This ToR also sets out the scope of work, deliverables, timeframe and payment terms for International Evaluator, Team Leader.
The essentials of the project to be evaluated are as follows:

PROJECT SUMMARY TABLE

Project Title:	Promotion of Biomass Production and Utilization in Georgia			
	Promotion of Biomass Production and Utilization in Georgia			
GEF Project ID:	4157		*at endorsement (Million US$)*	*at completion (Million US$)*
UNDP Project ID:	4335	GEF financing:	0.925	0.925
Country:	Georgia	IA/EA own:	0.155	0.155
Region:	Europe and Central Asia	Government:	0	0

Focal Area:	Climate Change	Other:	0	0
FA Objectives, (OP/SP):	0	Total co-financing:	0	0
Executing Agency:	Ministry of Environment and Natural Resources Protection of Georgia (MoENRP)	Total Project Cost:	1.08	1.08
Other Partners involved:	N/A	ProDoc Signature (date project began):		06/10/2013
		(Operational) Closing Date:	Proposed: 31/10/2017	Actual: 31/10/2017

OBJECTIVE AND SCOPE

The project has been designed to promote sustainable production and utilization of upgraded biomass fuels to meet the municipal services sector's heating needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and avoiding GHG emissions. There are four major expected outcomes of the project:

Enhanced and approved policy and regulatory framework for efficient utilization of biomass energy Increased market confidence in the feasibility of production and utilization of upgraded biomass fuels Created local supply of and demand for upgraded biomass fuels Improved public knowledge and stakeholder capacities for bioenergy development and replication
A copy of the project document which provides more information about the project can be found at the following link:
http://www.ge.undp.org/content/georgia/en/home/operations/projects/environment_and_energy/promoting-the-production-and-use-of-biomass-in-georgia.html

A main objective of this project is to facilitate a shift from fossil to biomass fuels, and to promote their production and usage in the municipal services sector with the main goal that by the end of this project a municipal biomass project (for heating) has been designed, underway, and has been implemented with the biomass pellets being supplied by a private sector company. Currently, the situation in Georgia is that there is very limited use of biomass energy (for either heat supply or electricity) due to a number of legal, regulatory, policy, financial, and awareness barriers. The goal of this project is therefore to help overcome these barriers with targeted technical assistance so that by the end of the project there is increased awareness of the importance of biomass energy and that by the end of this project there is significantly increased awareness of the importance of biomass energy and the first biomass demonstrations projects in Georgia have successfully been implemented with the support of this project.

The Terminal Evaluation will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.
The objectives of the evaluation are to assess the achievement of project results, to assess the extent to which the project has successfully carried out adaptive management following the mid-term review, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of future UNDP programming.

The project has originally had a duration of 4 years and has been planned to last from November 2011 to November 2015 but due to a late start and the fact that the project only really started in June 2013 the project applied for and received a 2 year extension from November 2015 to the end of October 2017. A mid-term review

of the project was carried out in November 2015 which made recommendations on how to improve the project over the last 2 years of the project implementation.
The total GEF Budget for the project amounted to $925,000. In addition the project, as originally designed, envisaged $4,555,000 USD of co-financing as follows:

Name of Co-financier (source)	***Classification***	***Type***	Project	%
Tbilisi Municipality	Local Government	Cash	3,000,000	67
Ministry of Environment	National Government	In-kind	100,000	2
D&V Ltd	Private Sector	Cash	500,000	11
Dioskuria Ltd.	Private Sector	Cash	400,000	9
Georgia Coal Ltd.	Private Sector	Cash / in-kind	300,000	7
UNDP	Implementing Agency	Cash	155,000	3
Total Co-financing			**4,455,000**	**100**

The Terminal Evaluation should also evaluate the extent to which this co-financing materialized as envisaged in the project design and the extent to which adaptive management was successfully undertaken to seek new co-financing, when co-financing failed to materialize. This is of importance in the case of this project due to the fact that most of the original co-financing envisaged in the project did not materialize and was instead replaced by new co-financing. It is important therefore, that the terminal evaluation assesses why this was the case and what are the lessons learned from this need to shift co-financing partners.

Evaluation approach and method
An overall approach and method[6] for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects[7]. A set of questions covering each of these criteria will be provided to the selected evaluator (see *Annex C*). The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point and Ministry of Environment and Natural Resources Protection, as well as UNDP Country Office, project team including international CTA, UNDP GEF Regional Technical Adviser on Climate Change Mitigation and other key stakeholders including co-financing partners as listed in the project document and new partners identified during the course of the project. The evaluator is expected to conduct a field mission to three project sites in eastern Georgia: Matani (Akhmeta), Manavi (Sagarejo) and Ponichala to conduct interviews with project grantees. Interviews will be also held with the project board members, key partners, contractors, grantees as well as few other stakeholders. The list of organizations/individuals will be provided by UNDP Georgia during the inception phase though at a minimum it should include following: UNDP Georgia, UNDP Istanbul Regional Centre, Ministry of Environment and Natural

[6] For additional information on methods, see the Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 7, pg. 163
[7] See the link for the Guidance

Resources Protection of Georgia, National Nursery, National Forestry Agency, NGOs - World Experience to Georgia, New Technology Center, Energy Efficiency Center, Greens Movement of Georgia, , "Greenergy" Ltd, "Nisoni" Ltd, and Biomass Association of Georgia. In addition, the evaluator should meet with and/or discuss the project with Tbilisi municipality, D&V limited, Dioskuria Limited, and Georgia Coal Limited all of whom provided co-financing letters to the project but did not participate with the view of understanding why they did not participate in the project. The reason for these meetings/discussions is to understand why these partners did not eventually participate in the project.

The evaluator will review all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national biomass strategy and related documents, feasibility studies on biomass, documents related to the establishment of the biomass association of Georgia, and other legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in Annex B of this Terms of Reference.

EVALUATION CRITERIA & RATINGS

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework (see Annex A), which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of: **relevance, effectiveness, efficiency, sustainability and impact.** Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary. The obligatory rating scales are included in Annex D.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry		Quality of UNDP Implementation	
M&E Plan Implementation		Quality of Execution - Executing Agency	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental:	
		Overall likelihood of sustainability:	

PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. The extent to which adaptive management was undertaken to replace co-financing that did not materialize shall also be assessed and evaluated. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US$)	Government (mill. US$)	Partner Agency (mill. US$)	Total (mill. US$)

	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

MAINSTREAMING

UNDP supports GEF financed projects are key components in UNDP country programming, as well as regional and global programmes. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender.

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated: a) verifiable improvements in ecological status, b) verifiable reductions in stress on ecological systems, and/or c) demonstrated progress towards these impact achievements.[8]

CONCLUSIONS, RECOMMENDATIONS & LESSONS

The evaluation report must include a chapter providing a set of **conclusions**, **recommendations** and **lessons learned**.

IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation resides with the UNDP CO in Georgia. The UNDP CO will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

EVALUATION TIMEFRAME

The total duration of the evaluation will be **20** working days including one (1) mission with up to 9 travel days envisaging 7 working days to Georgia (not including travel days or weekend days spent in Georgia) according to the following plan

Activity	Timing	Completion Date
Preparation of Inception Report	2 work days	July 4, 2017
Draft Evaluation Report	8 work days	July 10 - September 20, 2017

[8] A useful tool for gauging progress to impact is the Review of Outcomes to Impacts (ROtI) method developed by the GEF Evaluation Office: ROTI Handbook 2009

Evaluation Mission	7 work days (with Up to 9 travel days)	11 – 17 September 2017
Final Report	3 work days	October 17, 2017
Total	**20 work days**	

- **EVALUATION DELIVERABLES**

The evaluation team is expected to deliver the following deliverables:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides methodology, timing, and approach to final evaluation and initial observations based upon desk review of materials	No later than July 4 2017	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission	To project management, UNDP CO and to national partners, as appropriate
Draft Final Report	Full report, (per annexed template, Annex F) with annexes	Within 1 weeks of the evaluation mission	Sent to CO, reviewed by UNDP RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft	Sent to CO for uploading to UNDP ERC.

*When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report.

TEAM COMPOSITION

The terminal evaluation will be undertaken and led by independent International Evaluator, Team Leader and will be assisted by the National Consultant, Team Member. The consultants shall have prior experience in evaluating sustainable energy projects either for UNDP or for other donors. Experience with GEF financed projects is an advantage. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The Team leader must present the following qualifications:

- A Master's degree in fields related to Environment, Natural resources, M&E, Renewable energy, Management, or other related field.
- Recent experience with result-based management evaluation methodologies;
- Experience/proven record in undertaking evaluations with international organizations in the past 7 years;
- Experience/proven record in undertaking evaluations for UNDP or for GEF will be an advantage;

- Experience of working in former Europe & CIS Countries, preferably in energy or environment sector in the past 7 years;
- Experience working in Georgia in the past 7 years in the energy or environment sector is an asset;
- Work experience related to renewable energy in any country during the last 7 years is an asset;
- Work experience related specifically to Biomass energy projects will be an advantage;
- Fluency in English.

EVALUATOR ETHICS

Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (Annex E) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluations'

PAYMENT MODALITIES AND SPECIFICATIONS

Payment terms are as follows:

%	Milestone
10% of consultancy fee	upon submission and approval of the final Inception Report
40% of consultancy fee	upon submission and approval of the draft Terminal Evaluation report and following the mission to Georgia
50% of consultancy fee	upon finalization, submission and approval of the Terminal Evaluation report including consideration of all of the comments on the draft report
100% of travel costs	Upon arrival in Tbilisi, Georgia (including living allowance fee, ticket cost and any other travel related transfer costs)

APPLICATION PROCESS

Selection will be done using RBEC vetted roster. Individuals selected from the roster will be interviewed by Skype. Individuals shortlisted after the interview, i.e. passing 70% threshold, obtaining minimum 49 points out of total 70 points determined for the interview, will be requested to submit a financial offer indicating the total lump sum cost of the assignment (including daily consultancy fee, flight ticket, DSA and any other travel costs). Determined score for financial offer is 30 points.

Criteria for Evaluation will be Combined Scoring method – Individual receiving the Highest Combined Score will be awarded the contract.

UNDP applies a fair and transparent selection process that will take into account the competencies/skills of the applicants as well as their financial proposals.

6.2 TE evaluative matrix (evaluation criteria with key questions, indicators, sources of data, and methodology)

Evaluative Criteria Questions	Indicators	Sources	Method
Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?			
Are project outcomes contributing to national development priorities and plans in accordance with the national legal and regulatory frameworks?	Alignment to national/stakeholder priorities, clear and coherent descriptions	Project reports, stakeholders	Literature Review (LR), Interviews (I)
How does the project relate to the GEF-4 Strategic Programme #4 on "Promoting Sustainable Energy Production from Biomass" of the Climate Change Focal Area?	Alignment to GEF programme, clear and coherent descriptions	Project reports, stakeholders	Literature Review (LR), Interviews (I)
How did the project contribute to GHG emissions reduction within the project implementation cycle and beyond?	GHG emission reductions in tons of CO2	Project reports, calculations of GHG emission reductions from pilot projects	Literature Review (LR), Interviews (I)
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
Are the achieved project outcomes in line with the original or modified project objectives?	GHG emission reductions in tons of CO2, installed capacity in MW	Calculations of GHG emission reductions from pilot projects	Literature Review (LR), Interviews (I)
Where recommendations given during the mid-term review incorporated and was adaptive management applied?	Clear and coherent descriptions of action taken	Project reports, stakeholders	Literature Review (LR), Interviews (I)
What is effectiveness of project awareness raising and outreach activities/products on promoting the use of biomass among all project stakeholders?	Awareness material produced	Project reports, awareness material, stakeholders	Literature Review (LR), Interviews (I)
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?			
How efficient was the financial management of the project, including specific reference to cost-effectiveness of its interventions as well as co-financing provided?	Evidence of clear, transparent reporting, evidence of cost effective processes and purchases, spending of funds, co-funding provided	Project budget, information on co-funding	Literature Review (LR), Interviews (I)
What was the role of UNDP and National Implementing Agency in meeting the requirements	Contribution of UNDP and National Implementing	Project reports, stakeholders	Literature Review (LR), Interviews (I)

set out in UNDP Programme and Operations Policies and Procedures?	Agency toward project progress		
Are the systems for accountability and transparency of project management approach/results and meeting the relevant national norms and standards in place?	Evidence of clear, transparent reporting, evidence of cost effective processes and purchases	Project budget	Literature Review (LR), Interviews (I)
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
Whether the risks identified in project document and PIRs were appropriate and corresponding risk management strategies/systems were adopted and implemented?	Usefulness of risk analysis and associated tools	PIRs, project reports, stakeholders	Literature Review (LR), Interviews (I)
Whether or not national stakeholders participated in project management and decision-making have ownership for project outcomes and their further replication and scaling-up?	Involvement of national stakeholders	Project reports, minutes of meetings	Literature Review (LR), Interviews (I)
Was the project sustainability strategy relevant and efficient?	Analysis of relevance of sustainability strategy	Project reports, stakeholders	Literature Review (LR), Interviews (I)
Are there any environmental risks that may pose a threat to the sustainability of the project outcomes?	Evidence that any environmental risks to sustainability have been assessed and any mitigation measures taken.	Project reports, stakeholders	Literature Review (LR), Interviews (I)
Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?			
What contribution did the demonstration projects have on improving the environment situation in their locations?	Environmental indicators	Reports on pilot projects	Literature Review (LR), Interviews (I)
How the project did enable reducing pressure on corresponding natural resources (e.g. through reduced use of primary energy sources, and/or use of renewables)?	Biomass used in pilot projects	Reports on pilot projects, project reports	Literature Review (LR), Interviews (I)

6.3 Ratings Scales

Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution	***Sustainability ratings:***	***Relevance ratings***
6: Highly Satisfactory (HS): no shortcomings 5: Satisfactory (S): minor shortcomings 4: Moderately Satisfactory (MS) 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major problems 1. Highly Unsatisfactory (HU): severe problems	4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML):moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	2. Relevant (R) 1.. Not relevant (NR) ***Impact Ratings:*** 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
Additional ratings where relevant: Not Applicable (N/A) Unable to Assess (U/A		

6.4 TE mission itinerary

Date	**Time**	**Organization**	**Persons**
11 September 2017	10.00	UNDP	Nino Antadze Vakhtang Berishvili
	11.30	UNDP	Vakhtang Berishvili Natia Lipartiani
	13.30	PMO	Levan Gogaladze
	15.00	Ilia State University	Archil Magalashvili
	16.30	WEG	Murman Margvelashvili
12 September 2017	9.00	EEC	Giorgi Abulashvili Liana Garibashvili
	12.00	National Nursery	Rezo Bezhashvili
	14.30	Greenergy	Temur Matiashvili
	17.00	Nisoni	Archil Gogebashvili
13 September 2017	9.30	UNDP	Vakhtang Berishvili
	12.00	NTC	Archil Papava
	13.00	MENRP	Grigol Lazriev
	14.30	Green Movements	Rusudan Simonidze
	16.00	Ministry of Energy	Marita Arabidze Natalia Jamburia
	17.00	KfW	Hans Rieck
14 September 2017	10.00	Forestry Agency	Natia Iordanishvili
	11.00	GIZ	Natia Gobejishvili
	12.00	CENN	Revaz Getiashvili
	15.30	UNDP (closing meeting)	Natia Natsvlishvili Nino Antadze

6.5 List of persons interviewed

Mr. Giorgi Abulashvili	EEC – Managing Director
Mrs. Nino Antadze	UNDP Georgia – Energy and Environment Team Leader
Mrs. Marita Arabidze	Ministry of Energy – Head of Energy Efficiency and Renewable Energy Division

Mr. Vakhtang Berishvili	UNDP Georgia – Project Manager
Mr. Rezo Bezhashvili	National Nursery
Mrs. Giovanna Christo	International Expert
Mrs. Liana Garibashvili	EEC – Expert
Mr. Rezo Getiashvili	CENN – Environmental Projects Coordinator
Mrs. Natia Gobejishvili	GIZ – Advisor for Regional Cooperation
Mr. Archil Gogebashvili	Nisoni – Manager
Mr. Levan Gogoladze	PMO – Partner
Mr. Neil Harrison	reheat - Director
Mrs. Natia Iordanishvili	Forestry Agency – Deputy Head
Mrs. Natalia Jamburia	Ministry of Energy – Chief Specialist
Mr. Grigol Lazriev	Ministry of Environment and Natural Resources Protection – Head of the Climate Change Service
Mr. Archil Magalashvili	Ilia State University – Expert
Mr. Temur Matiashvili	Greenergy – Manager
Mr. John O'Brien	UNDP – Regional Technical Advisor
Mr. Archil Papava	NTC – Marketing Executive
Mr. Hans Rieck	GIZ - Director Sector Coordination South Caucasus
Mrs. Rusudan Simonidze	Green Movements - Expert
Mr. Murman Margvelashvili	WEG – Director
Mrs. Natia Natsvlishvili	UNDP Georgia – Assistant Resident Representative

6.6 List of documents reviewed

In alphabetical order

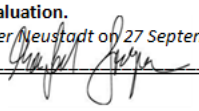
Document	Document type
Access to Finance for Biomass Energy Projects	Pdf
Annual Work Plan	Excel
Biomass Association of Georgia – Charter	Word
Biomass Association – Resolution of founders	Word
Biomass Project Action Plan	Excel
EEC Project Final Report	Word
Feasibility Study (economic and financial feasibility study of 3 pilot biomass production in Georgia)	Pdf
Final report on Standards	Word
Greenergy Report International Expert	Pdf
Green Movements Project Final Report	Word
Independent Auditors Report	Pdf
Mission 1 Report International Expert	Pdf
Mission 2 Report International Expert	Pdf
Mission 3 Report International Expert	Pdf
National Forest Agency Report International Expert	Pdf
Nisoni Report International Expert	Pdf
PEB Meeting Notes June 2016	Word
PEB Meeting Notes December 2016	Word
PEB Meeting Notes May 2017	Word
PIR 2016	Word
PIR 2017	Word
Stakeholder Meeting Minutes March 2016	Word
Stakeholder Meeting Minutes July 2016	Word
Stakeholder Meeting Minutes November 2016	Word

Stakeholder Meeting Minutes April 2017	Word
State Strategy for Development of Upgraded Solid Biofuels in Georgia	Word
Various promotional material	Pdf
Wood Chip Heating Initial Feasibility Study	Pdf

6.7 Signed UNEG Code of Conduct form

Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation Consultant Agreement Form[1]
Agreement to abide by the Code of Conduct for Evaluation in the UN System
Name of Consultant: Manfred Stockmayer
Name of Consultancy Organization (where relevant): _____
I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.
Signed at *Wiener Neustadt on 27 September 2017*
Signature: 

6.8 Signed TE final report clearance form

Midterm Review Report Reviewed and Cleared By:

Commissioning Unit

Name: _____

Signature: _____ Date: _____

UNDP-GEF Regional Technical Advisor

Name: _____

Signature: _____ Date: _____

6.9 Audit trail from received comments on draft TE report

Author	#	Para No./ comment location	Comment/Feedback on the draft TE report	TE team response and actions taken
UNDP CO	1	Table of Contents	Noticed some section titles do not correspond to actual sections / chapters. I assume this will be done at the last stage of the report finalization Annexes indicate MTR in number of places instead of Terminal Evaluation; please correct	Table wasn't updated, is done now.
RTA	2	Evaluation Rating Table	What role did the MENRP play? You write in the text that they did not show much interest and did not chair the PB meetings. Okay, I see you did that but since they showed no interest how did they get an MS rating?	Wording added in chapter 1.4 to clarify that national implementing partner needs to be chosen carefully and that project might have been much stronger if it had been located in the Ministry of Energy.
UNDP CO	3	Chapter 1.4	While I agree to the point, the only explanation for not having a Project Work Plan form the start of the project is no clarity on the project's partnership, especially for the investment grant mechanism, and creation of supply/demand element; this was the reason for keeping only annual work plans, as per UNDP standard procedure. However, after MTR, the project work plan for the remaining two years was developed and agreed by the PEB. Standard ProDoc format is followed, which do not require such details, but rather budget per years and outputs. Normally, the	Text reworded to refer to Inception Phase rather than ProDoc.

			detailed project work plans are developed during the inception phase. So perhaps you need to clarify this issue and refer to the inception phase??	
RTA	4	Chapter 1.4	What about the biomass association as a champion for full ownership of the further development of improved biomass?	The government needs to take initiative, private sector (and association) will follow. If UNDP cannot change the mind of the government, how should the association be able to do that?
RTA	5	Chapter 1.4	Greenergy is mainly out of action because it is not profitable.	Wording modified accordingly.
UNDP CO	6	Chapter 1.4	National Nursery pilot project: What type of assistance? And from where???	Wording added to clarify which assistance and from where.
UNDP CO	7	Chapter 1.4	Sustainability of Biomass Association: Disagree; the association has important plans, is active and in its initial phase of operation. Members agreed that first year will be managed by one of the members, and later reconsider membership fees, etc. can provide more info during conf call as well as PP presentation that association made at final workshop	There is no guarantee with a sustainable business plan, but it's better than just making ad-hoc applications for funding by one person/company
UNDP CO	8	Chapter 1.4	Financial viability of improved biomass: Fine, but could you please add a sentence in the end (or start) so what is the proposal for future directions? This rather long paragraph will be difficult to be addressed in the management response unless clear recommendation is given	Additional information on financial viability added in chapter "financial sustainability".
RTA	9	Chapter 1.4	Donors: I think you should list them. Who are they?	Donors added

RTA	10	Chapter 2.1	I think you should add some sentences on the mid-term review and what it concluded.	Summary on mid-term review added
RTA	11	Chapter 3.5	Co-financing City of Tbilisi: I think you should explain why. They insisted for a feasibility study.	Wording added for clarification
RTA	12	Lessons from other relevant projects incorporated into project design	Experience from EU shows that financial and regulatory incentives are very important to kick start the market. But this was not analyzed.	Wording added
UNDP CO	13	Adaptive management	It seems this happened because delivery of stoves was delayed, and this is fault of Project?	This is not meant as criticism here, but as a positive example of adaptive management. The project realised that municipalities are switching to gas and this could be avoided by efficient stoves. The fact that the switch really happened in some municipalities is confirming the findings of the project.
UNDP CO	14	Adaptive management	Barrier for pilot projects: This is all true; however, the main point is that due to the legal barrier, the NFA had significant delays in implementing pilot project, and until the legal amendments were made, the pilot project management was transferred to the Nursery; MoENRP senior management and UNDP CO were actively involved in these consultations that resulted in continued operation and 'no failure' of the pilot project; this effort of UNDP/MoENRP could be acknowledged?	Wording added for clarification
UNDP CO	15	Feedback from M&E activities used for	Recommendation 3: The PEB meetings always discussed the progress report for the previous	I asked Vakhtang to send emails related to invitations for the PEB meeting in May 2016. There is no indication

		adaptive management	period and approved work plan for the next period. The Project Work Plan (2016-2017) was indeed reviewed and followed. It is unfortunate if this is not seen in the minutes, but it was of course reviewed and referred to.	that any document was sent before the meeting (which would have allowed review – you cannot review a workplan during a 90 minutes meeting) nor was the approved workplan sent together with the minutes (neither were the slides of the presentation).
UNDP CO	16	Feedback from M&E activities used for adaptive management	Recommendation 3: The standard format for PEB meeting minutes was followed; it is a pity if evaluation mission considers the minutes not informative enough; as for the invitee list, the evaluation mission could have asked for the invitations, sent by the PMU where invitees are listed.	There was quite some guidance in the MTR how to make more clear what was happening in the PEB meetings. Also, it was suggested during the MTR that it is mentioned in the minutes who was invited and who participated, which was not reflected.
RTA	17	Feedback from M&E activities used for adaptive management	Recommendation 4: I suggest to change wording. As project didn't cover all Georgia. It just looked to select the demo projects from the entire Georgia.	Wording modified
RTA	18	Feedback from M&E activities used for adaptive management	Recommendation 6: International Consultant: Can we have some assessment of his performance and how it went.	Wording added
UNDP CO	19	Feedback from M&E activities used for adaptive management	Recommendation 6: Was sure these reports/or recommendations /.guidance were shared with project experts or businesses…. Also, during his missions, Neil was providing his guidance to businesses , so indeed his recommendations were well known. Actually, he was very helpful during missions, but afterwards was disappearing and submitting mission reports with significant delays, the	I cannot confirm that the reports were late, as they were sent the same month of the mission or the next month. None of the people of the pilot projects I spoke to understood English, so there is quite a risk that Neil's recommendations were not understood. The reports were well prepared, with pictures, showing what the issues are. It was confirmed by Vakhtang that the reports were not disseminated.

			reports were basically summaries of what he spoke during his missions, including recommendations to businesses	
RTA	20	Project Finance	This table gives very little info on what the money was actually spent on. More detailed info would certainly be helpful as this table provides no clarity whatsoever.	Additional table added comparing plan and actual by budget line.
RTA	21	Progress towards Results Matrix	I don't understand if it is MU here why overall goal is not MU but MS. Perhaps you can explain.	The sentence after this table refers to project objective and its stated targets and therefore takes more into account than just the Project Goal. If you read below, there are certain outcomes, where the rating is U, some with MU, some with MS, some with S. Overall, this gives MS.
RTA	22	Progress towards Results Matrix	Outcome 1: But if there are no regulatory or policy incentives how do we know it will succeed. Maybe it is just another paper report like the SEAP for Tbilisi city which says in words they will support biomass but when it is time to put their money where their mouth is, they soon disappear.	Wording added for clarification.
UNDP CO	23	Progress towards Results Matrix	Pilot installations: Will be useful to suggest ways / means of support that will be useful. Otherwise, it seems either UNDP or MoENRP should take this 'burden', but neither have funds available to provide this support. Also, could you specify what type of support? Technical? Or financial?	Wording added for clarification, details on support required is already mentioned in more detail in report.
UNDP CO	24	Chapter 5.2	Sections 5.2, 5.3 and 5.4 are structured in a useful manner – corrective actions, etc. however, the will be useful to provide	Will be done in the final version.

			numbered list of recommendations and/or issues; would you mind restructuring /renaming these actions into recommendations? I know you followed the TE format provided in the ToR, but since we will need to do management response, it will be useful to number and highlight recommendations	