



**United Nations Development Programme**

**Government of Serbia**

**PIMS 4382 Reducing Barriers to accelerate the Development of  
Biomass Markets in Serbia**

**Terminal Evaluation (TE) Report**

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## BASIC REPORT INFORMATION

**Title of UNDP supported GEF financed project:** Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia

**UNDP PIMS#:** 4382

**GEF project ID#:** 4517

**Terminal Evaluation Review time frame:** October 2014 – March 2019

**Date of Terminal Evaluation Review report:** 22 March 2019

**Region and countries included in the project:** South East Europe, Serbia

**GEF Operational Focal Area/Strategic Program:** Promote Investment in Renewable Energy Technologies

**Executing Agency/Implementing Partner and other project partners:** Ministry of Energy and Mining (lead partner) and Ministry of Agriculture and Environmental Protection of the Republic of Serbia

**TE members (international consultant):** Mr. Manfred Stockmayer (international consultant)

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## ABBREVIATIONS

BSU	Biomass Support Unit
CEO	Chief Executive Officer
CHP	Combined Heat and Power
CO <sub>2</sub>	Carbon Dioxide
CTA	Chief Technical Advisor
EBRD	European Bank for Reconstruction and Development
FIT	Feed-In Tariff
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
I	Interview
IFC	International Finance Corporation
IGM	Investment Grant Mechanism
KfW	Kreditanstalt für Wiederaufbau
kW	Kilowatt
LR	Literature Review
M&E	Monitoring and Evaluation
MoME	Ministry of Mining and Energy
MTR	Mid-Term Review
MW	Megawatt
MWh	Megawatt hour
NIM	National Implementation Modality
NGO	Non-governmental organization
NPD	National Project Director
NREAP	National Renewable Energy Action Plan
PIF	Project Identification Form
PIR	Project Implementation Review
PIMS	Project Information Management System
PMU	Project Management Unit
Prodoc	UNDP Project Document for “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”
Project	The project under review: “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”
PPG	Project Preparation Grant
RTA	Regional Technical Advisor
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
tCO <sub>2</sub> eq	Tons of CO <sub>2</sub> equivalent
TE	Terminal Evaluation
ToR	Terms of Reference
UNDP	United Nations Development Programme
US\$	US Dollar

## 2. EXECUTIVE SUMMARY

### 2.1 Project Information Table

Project Title	Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia		
UNDP Project ID (PIMS #):	4382	PIF Approval Date:	28.12.2011
GEF Project ID (PMIS #):	4517	CEO Endorsement Date:	28.01.2010
ATLAS Business Unit, Award # Proj. ID:	00086739, 00074238	Project Document (ProDoc) Signature Date (date project began):	21.05.2014
Country(ies):	Serbia	Date project manager hired:	January 2014
Region:	South East Europe	Inception Workshop date:	30.10.2014
Focal Area:	Climate Change	Midterm Review completion date:	February 2017
GEF Focal Area Strategic Objective:	Promote Investment in Renewable Energy Technologies	Planned closing date:	May 2019
Trust Fund [indicate GEF TF, LDCF, SCCF, NPIF]:	GEF	If revised, proposed op. closing date:	
Executing Agency/ Implementing Partner:	Ministry of Energy and Mining (lead partner) and Ministry of Agriculture and Environmental Protection of the Republic of Serbia		
Other execution partners:			
Project Financing	at CEO endorsement (US\$)	at Terminal Evaluation (US\$)*	
[1] GEF financing:	US\$ 2,845,000	US\$ 2,845,000	
[2] UNDP contribution:	US\$ 560,000	US\$ 560,000	
[3] Government:	US\$ 1,800,000 In-kind contributions	US\$ 1,800,000 In-kind contributions	
[4] Other partners:	Private sector US\$ 23,800,000 Others US\$ 1,470,000	Private sector US\$ 22,655,380 cash, Others US\$ 1,027,000 in-kind contributions	
[5] Total co-financing [2 + 3+ 4]:	US\$ 27,630,000	US\$ 26,042,380	
PROJECT TOTAL COSTS [1 + 5]	US\$ 30,475,000	US\$ 28,887,380	

### 2.2 Project Description

The objective of the Project was to remove barriers for biomass to electricity technologies in the agricultural (biogas) and wood sectors to facilitate the future deployment of efficient technologies and increase the share of sustainable biomass used in the Serbian electricity sector. The project ran from May 2014 to June 2019.

The Project was intended to complement the Government activities to promote the use of biomass as an energy source in Serbia for electricity generation, by combining

- a technical assistance package which includes building the institutional capacity required to address the legal and institutional barriers as well as creating awareness among all relevant stakeholders from the industry, government and financing sectors and

- designing an Investment Grant Mechanism (IGM) combining the GEF grants with EBRD loans to develop bankable projects through innovative financial packaging and to leverage other sources of financing.

The overall objective of the Project was to reduce barriers and accelerate the biomass market in Serbia. The strategy was built around five outcomes:

- Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia;
- Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed, approved and implemented;
- Outcome 3: Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects;
- Outcome 4: A minimum of six biomass projects are successfully financed, constructed and operating by the end of the Project;
- Outcome 5: At least 12 additional biomass projects are being supported by the Biomass Support Unit and Investment Support Mechanism by the end of the Project.

The target of the Project was to add at least 3 MW of installed capacity in new electricity generation projects based on biomass and to achieve overall emission reductions over the lifetime of the investments of 20 years of 624,000 tCO<sub>2</sub>.

The Serbia Biomass Project was implemented by UNDP, the Executing Agency was the Ministry of Mining and Energy (MoME). Day-to-day management of the Project was carried out by a Project Management Unit (PMU) that was independent of but answerable to the Executing Agency (MoME) and both supported and overseen by the GEF Implementing Agency (UNDP Serbia). A Project Board has been established, which consists of Ministry of Mining and Energy, Ministry of Agriculture, Forestry and Water Management, UNDP Serbia and the PMU.

## 2.3 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**

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

## 2.4 Summary of conclusions, recommendations and lessons

The main conclusion of this evaluation is that the project is highly satisfactory as it has significantly exceeded the targets for installed capacity of biomass and CO<sub>2</sub> emission reductions. In addition, \$22.7 million US\$ of private sector investment has been leveraged by the project at a ratio of over 7-1 when compared to the \$3 million US\$ GEF grant.

There are a number of corrective actions to be suggested based on the experience and lessons learnt of the Reducing Barriers to accelerate the Development of Biomass Markets in Serbia Project. These are as follows:

- The final version of the Project Document was modified by several people and underwent various last-minute changes before receiving GEF approval. This led to conflicting targets (3 MW vs 4 MW installed capacity in the log frame), wrong calculations (GHG emission reduction calculations were based on 6.9 MW, lifetime GHG emission reductions were calculated in a detailed table Annex 8.4 to be 70,000 tons whereas the text talked about 1,247,481 tons) and other inconsistencies in the document. A final quality check of the document would help in increasing consistency and supporting a smooth start of project implementation.
- Due to elections and flooding in Serbia, the start of the Project was delayed from early 2014 to October 2014. More than three years had passed since work on the ProDoc had started and there was a time span of 16 months between first presentation of the ProDoc to GEF and project start. There were a number of developments in Serbia, which had an impact on the Project, such as development of the National Renewable Energy Action Plan, start of GIZ/KfW activities or work of the S2Biom Project on the Serbian Biomass Atlas. In such a situation, a critical, thorough review of outcomes, outputs and activities in the inception phase of the project is necessary and the Project Results Framework should have been modified following the inception workshop. In addition to that, it would have been helpful to hire an international CTA to support the project from the start of the project. This was done only to a limited extent, as the PMU didn't want to – for obvious reasons – challenge outcomes and outputs of the newly started projects. For projects like these, support and guidance by experienced UNDP staff would be helpful in discussing and finally deciding whether modifications to the project can be made and to what extent these modifications should be made.
- The MTR Report noted that there was an error in calculating the emission reduction target as determined during project implementation, however, the MTR Report failed to provide a correction of the emission reduction target, which was based on inconsistencies of the ProDoc. A correction at that point in time would have been helpful for the PMU to receive a clear indication of what the actual target was.
- As in many other projects, the ProDoc included the adoption of policies and regulations as an output. Whereas projects can commit to work on policies and regulations, the adoption of these legal documents is in many cases not dependent on the quality of work provided by the project, but on political decisions. Projects should therefore be careful with the level of commitment when it comes to the legal framework.
- Biomass has become an interesting topic in Serbia over the recent years. A number of initiatives have been working on promoting the increased use of biomass for energy purposes, both for heat and electricity. A stronger coordination with other initiatives is necessary to avoid duplications. Adaptive management was applied by the PMU to avoid duplications on specific topics and coordination on an expert level was good, however, coordination at the level of decision makers is helpful to improve coordination.
- Project design and the M&E system as defined in the project document must include interim targets and milestones, as these are helping project management in checking progress and taking steps of adaptive management, if necessary.



There are a number of actions, which should be followed up to achieve sustainable benefits from the Project:

- As there are a number of initiatives and programs working on biomass in Serbia, coordination between various government players is important. In addition to ad-hoc committees, which are being established on emerging issues involving technical staff, regular coordination between all relevant ministries on a level of decision makers would be beneficial to further promote the increased use of biomass.
- The Private sector has had an enormous contribution to the success of the Project. Without the perseverance of investors, their willingness to overcome new hurdles coming up and their ability to cover additional costs, only a small share of projects would have been implemented. The lessons learnt in the process of getting approvals on a municipal level and connecting to the electricity grid are extremely valuable. It would be important to invite private sector to share this experience with all relevant stakeholders, so implementation of new projects will become smoother.
- It was discussed during the on-site mission that the Energy Community is requesting Serbia to apply auctioning for adding new renewable energy capacity to the grid. It is important to understand that biogas/biomass and other renewables such as solar PV or wind power cannot be compared. Among other reasons, biomass/biogas projects are delivering constant power to the grid (the Bac projects are achieving more than 8,000 full load hours), provide new work opportunities for local companies and people and in many cases use organic residues for generating electricity. It is advisable that biomass/biogas does not have to compete with other renewables under an auctioning scheme, but that the feed in tariff scheme for biogas continues and is prolonged.
- There are a number of new project opportunities, which are currently in an early stage. Based on the work with municipalities, 3 new projects for use of biomass in municipalities have been identified. As part of the biomass potential study, which was established in cooperation with the Standing Committee on Cities and Municipalities and the Finnish Embassy, 2 new projects were identified and proposed to the Ministry of Mining and Energy. These opportunities should be followed up.
- As mentioned in the report, biogas projects are not to produce electricity at current market rates of electricity due to the cost situation of input material. As a consequence, prolongation of a FIT (at lower level compared to current situation) should be pursued for projects currently under operation. Also, enforcing the current regulatory framework on organic waste would lead to a change in the price level of input material for biogas plant operators, which would be positive for the financial sustainability of these projects.
- The e-trading platform, which was set-up as part of the Project, is an excellent opportunity for sellers and purchasers of various forms of biomass to meet and to create a transparent market. Sustaining this platform would be key factor for the viability of biomass projects in Serbia. This should be achieved – as envisaged by the Chamber of Commerce – by membership fees as well as revenues from selling advertisements. As the Chamber is running a number of platforms and can keep costs low, this looks feasible.
- Other UNDP GEF projects in the region working on renewable energy projects and accelerating the development of renewable energy technologies should be invited to Serbia to see the excellent project results.

### 3. INTRODUCTION

#### 3.1 Purpose of the evaluation

The “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia” Project (PIMS #4382) was signed in May 2014 and had an original closing date of 29 May 2018. After the Mid-Term Review (MTR), the Project got extended by one year and is now finishing in May 2019. The Project has been designed to reduce barriers in generating electricity from biomass in Serbia and to accelerate the development of the biomass market in Serbia, both leading to sizeable reductions in GHG emissions.

The overall objective of the Project was to reduce barriers and accelerate the biomass market in Serbia. The strategy was built around five outcomes:

- Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia;
- Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed, approved and implemented;
- Outcome 3: Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects;
- Outcome 4: A minimum of six biomass projects are successfully financed, constructed and operating by the end of the Project;
- Outcome 5: At least 12 additional biomass projects are being supported by the Biomass Support Unit and Investment Support Mechanism by the end of the Project.

In accordance with UNDP and GEF requirements, the project was 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.

#### 3.2 Scope and Methodology

The TE was 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 (March 2019) and includes 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**

<i>Ratings for Outcomes, Effectiveness, Efficiency, M&amp;E, I&amp;E Execution</i>	<i>Sustainability ratings:</i>	<i>Relevance ratings</i>
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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)  <b>Impact Ratings:</b> 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
Additional ratings where relevant: Not Applicable (N/A), Unable to Assess (U/A)		

### 3.3 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.

## **4. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT**

### **4.1 Project start and duration**

The Project Document was signed in May 2014 and had an original closing date of 29 May 2018. After the Mid-Term Review (MTR), the Project got extended by one year and is now finishing in June 2019.

### **4.2 Problems that the project sought to address**

The objective of the Project was to remove barriers for biomass to electricity technologies in the agricultural (biogas) and wood sectors to facilitate the future deployment of efficient technologies and increase the share of sustainable biomass used in the Serbian electricity sector. The Project was intended to complement the Government activities to promote the use of biomass as an energy source in Serbia for electricity generation, by combining

- a technical assistance package which includes building the institutional capacity required to address the legal and institutional barriers as well as creating awareness among all relevant stakeholders from the industry, government and financing sectors and
- designing an Investment Grant Mechanism (IGM) combining the GEF grants with EBRD loans to develop bankable projects through innovative financial packaging and to leverage other sources of financing.

An investment grant mechanism was selected as the most appropriate financial support mechanism for the Serbian biomass industry to reduce the risk of projects not being commercially viable or able to attract debt finance. This was done only after careful and thorough analysis, including several discussions with investors and financing institutions (EBRD, IFC, etc.) active in the region which concluded that this type of mechanism has the greatest potential to overcome barriers and help develop the biomass market in Serbia.

The overall objective of the Project was to reduce barriers and accelerate the biomass market in Serbia and the Project included five outcomes:

- Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia;
- Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed, approved and implemented;
- Outcome 3: Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects;
- Outcome 4: A minimum of six biomass projects are successfully financed, constructed and operating by the end of the Project;
- Outcome 5: At least 12 additional biomass projects are being supported by the Biomass Support Unit and Investment Support Mechanism by the end of the Project.

### **4.3 Immediate and development objectives of the project**

The aim of this Project was to accelerate the development of biomass for electricity generation projects in Serbia by developing and successfully launching a biomass support unit and implementing

a sustainable financial mechanism to support biomass projects which will continue beyond the lifetime of this Project.

The immediate objectives of the Project were to install at least 3 MW of installed capacity supported by this Project fully operation by end of the Project. These projects were supposed to lead to GHG emission reductions of 1.2 million tCO<sub>2</sub>eq over the lifetime of the investments of 20 years.

#### **4.4 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 projects over the lifetime of the investments of 20 years from projects supported by the UNDP GEF project. Baseline indicators both take into account GHG emission reductions generated from replacing grid electricity with electricity generated by the biomass projects as well as heat supply.

For the carbon intensity of the grid, a grid emission factor of 0.945 tons of CO<sub>2</sub> per MWh of electricity was used for baseline calculations. In the Cost-Benefit-Analysis carried out during the Project, a revised factor of 1.1 tCO<sub>2</sub>/MWh was calculated. This factor will be applied both for baseline and project scenario. The emission factor for heat (0.32 tCO<sub>2</sub>/MWh) remains unchanged.

#### **4.5 Main stakeholders**

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

- Ministry of Mining and Energy
- Ministry of Agriculture and Environmental Protection
- Standing Conference of Towns and Municipalities
- Regional Development Agency Srem
- Institute for Standardization of Serbia
- Municipality of Alibunar
- Municipality of Ruma
- Private investors
- Commercial banks
- EBRD

Immediately after project start in mid 2014, the EBRD reversed its initial readiness for cooperation and declined to work with the Project. The reason given was that the WeBSEDF II credit line (for direct financing of medium-sized EE/RES projects) has already been committed and the approval of new funds was expected only in 2015 (with high degree of uncertainty whether funds will be approved at all). This has happened after the Project was already approved by the GEF, but this was not emphasised in the Inception report (as noted in the MTR Report). As a consequence, the project team had to reinvent the implementation strategy and find alternative mechanisms for project implementation, in particular for the Investment Grant Mechanism.

In July 2017, the Ministry of Agriculture and Environmental Protection was split into the Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection. Cooperation with the Ministry of Agriculture continued being fruitful, there was little cooperation with the Ministry of Environmental Protection due to political reasons.

The Institute for Standardization of Serbia was originally envisaged as a partner in the Project. As they received support in translation of standards from GIZ, their participation in the Project was not required. Also, the Municipality of Ruma did not participate in the Project.

However, new partners emerged that were not listed in the project document who did become important partners of the project. This includes the following companies:

- Forkom doo, Beograd
- BGS gama BP doo, Bač
- BGS beta BP doo, Bač
- BGS alfa BP doo, Bač
- Biogas Energy doo, Alibunar
- Bioelektra doo, Zrenjanin

## 4.6 Expected Results

At project inception, the expected results were as follows:

- Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia
  - Output 1.1: Biomass Support Unit Established and Operational with Team in Place to Support Biomass Projects in Serbia
  - Output 1.2 Designed and Implemented Training Modules on Biomass Energy for local municipalities and entrepreneurs based upon the UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants
  - Output 1.3 At least 16 completed regional seminars on biomass energy that employed the designed training module and the UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants will be presented (both demand side and supply side)
  - Output 1.4: Completed studies on biomass and preparation of “Serbian Biomass Atlas”
  - Output 1.5: Incorporated new course on Biomass Energy at the University of Belgrade & Novi Sad
  - Output 1.6: Completed national public awareness raising campaign on Biomass Energy run by the Biomass Support Unit
  - Output 1.7: Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia prepared by the Biomass Support Unit
  - Output 1.8 E-trade platform
  - Output 1.9: Project Website
- Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed, approved and adopted
  - Output 2.1: Adopted and implemented technical standards and regulations for biomass energy projects in line with international best practices
  - Output 2.2: Policies and regulations to promote biomass supply and its sustainability adopted and implemented
  - Output 2.3: Appropriate licensing procedures developed and in place to support the long-term development of the biomass market in Serbia
- Outcome 3: Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects

- Output 3.1: Developed and adopted National Programme for Supporting Biomass Projects
- Output 3.2: At least 20 completed training seminars by the Biomass Support Unit for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the National Biomass Programme
- Outcome 4: A minimum of six biomass projects are successfully financed, constructed and operating by the end of the project
  - Output 4.1 Investment Grant Support Mechanism
  - Output 4.2 Agricultural biomass projects are selected under the Investment Grant Support Mechanism and are developed, constructed and operational by the end of the project
  - Output 4.3 Woody biomass projects are selected under the Investment Grant Support Mechanism and are developed, constructed, and operational by the end of the project
- Outcome 5: At least 12 additional biomass projects are being supported by the Biomass Support Unit /Investment Support Mechanism by the end of the Project
  - Output 5.1 Twelve 12 additional biomass projects in Serbia are successfully supported beyond those which are partially assisted with GEF funds
  - Output 5.2 Produced documentary film on the implemented Biomass Energy pilot projects produced by the Biomass Support Unit

During the Inception Phase, some of the outputs were modified:

- Output 1.4: Completed studies on biomass and preparation of “Serbian Biomass Atlas’: excluded from project, as the Biomass Atlas will be prepared by another project.
- Output 3.2: At least 20 completed training seminars by the Biomass Support Unit for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the National Biomass Programme: reduce to 10 seminars, as number of banks and project developers in Serbia is not that big.

## 5. FINDINGS

### 5.1 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 Project faced a number of challenges, which were based on assumptions made during project preparation and in the ProDoc:

- The core of the Project was the implementation of the Investment Grant Mechanism - IGM (in the ProDoc also called Investment Support Mechanism). The BSU was supposed to identify suitable projects for financing based on two calls for proposals. The BSU would have then used its technical capacity and also employ technical consultants to improve the bankability of the selected projects. Following, it would have referred them to EBRD for financing, which would have conducted a separate evaluation of the potential projects. The projects would have been subject to the regular approval process applied by the EBRD to small projects (the MTR Report provides extensive background on the planned set-up).

With the withdrawal of EBRD from the Project in mid 2014, the entire process of selecting projects and awarding the grant had to be revised. The Project Team decided for an implementation plan in 3 stages:

- Stage I: One public call to establish a pool of banks, which will participate in the UNDP-GEF Project;
- Stage II: One public call for the selection of 6 investors in biomass/biogas fired CHP facilities;
- Stage III: Grant awards during preparation and construction of 6 biomass/biogas fired CHP facilities.

A detailed description of all steps can be found in the MTR Report.

The revised implementation strategy worked well, and finally contracts for grant funding were signed with 6 biogas companies. The table below shows the name of the 6 companies, installed capacity, total investment costs, grant given and the commercial bank providing loan financing.<sup>1</sup>

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<sup>1</sup> The investors into the 3 projects in Bac received their EBRD loan through their own contacts to EBRD in Slovakia as well as EBRD Headquarters in London.



Name	Capacity (MW)	Investment (M USD)	Grant (USD)	Commercial bank
Forkom doo,	0.20	1.42	222,400.40	Pro Credit Banka
BGS gama BP doo,	0.65	2.14	275,519.92	EBRD (WEBSSEDF)
BGS beta BP doo,	0.65	2.14	275,519.92	EBRD (WEBSSEDF)
BGS alfa BP doo,	0.65	2.14	275,519.92	EBRD (WEBSSEDF)
Biogas Energy doo,	3.57	12.43	275,519.92	AIK Banka
Bioelektra doo,	0.60	2.37	275,519.92	ERSTE Banka
<b>TOTAL</b>	<b>6.32</b>	<b>22.64</b>	<b>1,600,000</b>	

- The ProDoc listed 6 Serbian companies, which had provided co-funding commitments during the project preparation phase. The total cash commitment of these companies was US\$ 23.8 million. From these 6 companies, only one company applied for the grant, but the application got rejected as the project hadn't achieved financial closure. Still, the Project was able to secure private sector co-funding in cash of US\$ 22.7 million, provided by the following companies:
  - Forkom doo, Beograd
  - BGS gama BP doo, Bač
  - BGS beta BP doo, Bač
  - BGS alfa BP doo, Bač
  - Biogas Energy doo, Alibunar
  - Bioelektra doo, Zrenjanin

The Project identified a number of risks which were described in the Project Document:

- Climate change – risk level medium
- Supply risks – risk level medium
- Poor cooperation between government stakeholders – risk level medium
- Inadequate project implementation – risk level medium
- Lack of ongoing, long term political and government support for improved biomass energy sector in Serbia – risk level low
- Use of inappropriate biomass technologies for projects – risk level low

The issues the Project faced during its implementation showed that the project risks were properly identified in the ProDoc and well managed during project implementation. The main challenge from the risks identified was the cooperation between government stakeholders, which proved to be challenging. The establishment of the BSU worked well, 14 meetings were held between project start and April 2017. Work in the BSU was described by stakeholders as constructive, but after the elections in early 2017 cooperation got difficult and no further meeting of the BSU was held. The Project overcame well the supply risk by providing good and extensive information on the availability of various types of biomass resources. Also, the Project was well managed, thereby overcoming the risk of inadequate project implementation.

### Lessons from other relevant projects incorporated into project design

For project design, the experience from recently installed biogas projects was taken into consideration. This included:

- Alltech Fermin in municipality of Senta, 1.6 MW installed capacity, operation started in late 2011.

- Lazar Dairy in municipality of Blace, 1.0 MW installed capacity, operation started in May 2012.
- EnviTec Biogas AG in municipality of Curug, 0.6 MW installed capacity, operation started in January 2013.
- Sava Kovacevic, 1.0 MW installed capacity, operation started in October 2012.

The ProDoc also took note of the efforts of KfW (Kreditanstalt für Wiederaufbau), which planned at the time of project preparation a EUR 110 million program (EUR 100 million soft loan with 15 years maturity plus EUR 10 million grant) in district heating plants with public ownership. The aim of the Project was to support several district heating companies in their efforts to switch to biomass as fuel and/or to build new biomass-based CHP plants. To avoid duplication of efforts and increase the added value of Project, it was decided that work will focus on removing barriers for biomass to electricity technologies in the agricultural (biogas) and wood sectors to facilitate the future deployment of efficient technologies and increase the share of sustainable bio energy in the Serbian electricity sector.

### **Planned stakeholder participation**

The main instrument for stakeholder participation was the Biomass Support Unit (BSU) which was planned to be established in the Ministry of Mining and Energy (MoME) – on the approval of the GEF Project- with the objective to facilitate the investments on agricultural and wood biomass energy projects, which due to various legal, institutional and financial barriers cannot attract enough financial resources from other sources. The original plan was that the BSU will include permanent members from

- other relevant ministries (Agriculture and Environmental Protection) in addition to the Ministry of Mining and Energy and
- external project partners from different institutions relevant for the project (EBRD, Serbian Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency/Srem).

### **Replication approach**

The project design and implementation envisaged development of the biomass market and replication after end of the Project activities. Replicability has been taken into account throughout the project design phase:

- Directly – through support of Biomass Support Unit provided to at least 12 additional projects - through technical assistance and investment grants (Outcome 5 – Output 5.1) and through the continued existence of the Biomass Support Unit beyond the lifetime of the Project.
- Indirectly – through realized flagship biomass projects which will give confidence to investors that such projects are commercially viable with proven technology, training, information dissemination and development of National Biomass Program.

### **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 Serbia represented an important advantage.

## Linkages between project and other interventions within the sector

As mentioned in the chapter on “lessons from other relevant projects”, it was noted during project preparation that KfW was planning a massive investment support program aiming at working with district heating companies and supporting them in their efforts to switch to biomass as fuel and/or to build new biomass-based CHP plants. The project is now being implemented in cooperation with GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) at a smaller scale (around a fourth of the original size), entitled “Development of a Sustainable Bioenergy Market in Serbia” (<http://www.bioenergy-serbia.rs>). The project still has a focus on district heating, but it looking at all uses of biomass in Serbia. The projects has organized a number of workshops and seminars in order to promote their services, thus saturating the market by exposing essentially same limited group of interested people to frequent events on biomass subject.

The EU supported S2Biom project ([www.s2biom.eu](http://www.s2biom.eu)) has been, among its other activities, developing a computerised Biomass Atlas toolset, which was published in 2016 (<https://s2biom.wenr.wur.nl/>). The project informed UNDP in October 2014 that “the toolset will be publically available online and will be based on update harmonized datasets (for biomass cost supply) at local, regional, national and pan European level for EU28, western Balkans, Moldova, Turkey and Ukraine”. Consequently, a decision was taken in the UNDP/GEF project inception workshop that that the Project will not invest any resources for a similar activity (Biomass Atlas - Output 1.4) within the UNDP/GEF project, but will rely on the results and outputs of the mentioned S2Biom project. This is an excellent example of smart and productive donor co-operation and related adaptive project management, which hopefully would also work with other donors.

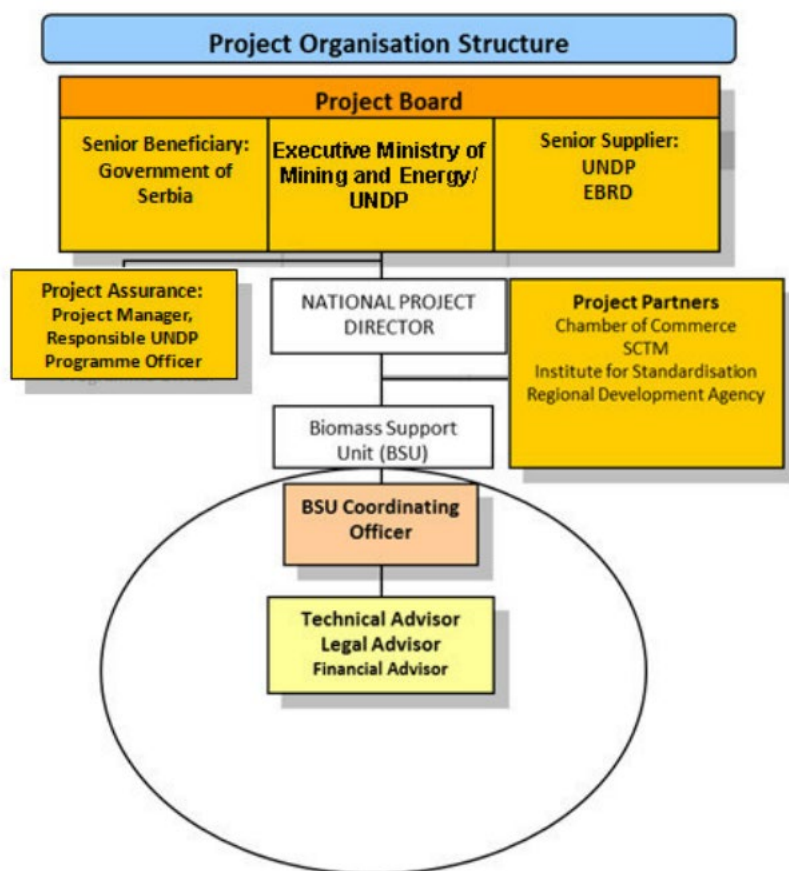
## Management arrangements

The Serbia Biomass Project was implemented by UNDP, the Executing Agency was the Ministry of Mining and Energy (MoME). Day-to-day management of the Project was carried out by a Project Management Unit (PMU) that was independent of but answerable to the Executing Agency (MoME) and both supported and overseen by the GEF Implementing Agency (UNDP Serbia). A Project Board has been established, which consists of Ministry of Mining and Energy, Ministry of Agriculture, Forestry and Water Management, UNDP Serbia and the PMU. The Project Board held 8 meetings during the course of the Project with MoME, UNDP and PMU participating in all meetings.

A key component in the management arrangements was the Biomass Support Unit (BSU). The BSU was setup in the MoME and was supposed to include permanent members from i) the other relevant ministries (Agriculture and Environmental Protection) and ii) external project partners from different institutions relevant for the Project (EBRD, Serbian Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency/Srem).

The figure below shows the original project organisation structure.

### Figure 1: Project Organisation Structure



## 5.2 Project implementation

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

Throughout the implementation of the Project, adaptive management was a key approach for the Project Team and contributed to the excellent results of this Project. Adaptive management was applied in the following cases:

- In the Inception Phase of the Project, it became clear that some activities had to be excluded (work on Biomass Atlas, as this was covered by another project) or the target had to be revised (10 instead of 20 seminars for banks and project developers).
- After Project start it was concluded that adequate licensing procedures for biomass already exist. The Project has been working, on guidance, information sharing and training activities on licensing.
- A National Renewable Energy Action Plan was already developed once the Project started. As corrective action, 29 municipal biomass balances and biomass programs and plans were developed, which led to identification of several investment opportunities.
- The Institute for Standardization of Serbia was originally envisaged as a partner in the Project. As they received support in translation of standards from GIZ, their participation in the Project was not required.

- Immediately after project start, the EBRD reversed its initial readiness for cooperation and declined to work with the Project. This has happened after the Project was already approved by the GEF. As a consequence, the project team had to reinvent the implementation strategy and find alternative mechanisms for project implementation, in particular for the Investment Grant Mechanism.
- There were 5 recommendations from the MTR, all of them were implemented.
- Co-financing commitments in cash from private sector at CEO Endorsement were given by 6 different companies and totaled US\$ 23.8 million. Interestingly, none of these companies finally received a grant funding for implementation, still, cash co-financing commitments of private sector reached US\$ 22.7 million (95% of the expected figure). This is an excellent example of adaptive management and shows the high quality of work delivered under this Project. In total, co-financing commitments from all partners are US\$ 26.0 million (94.3% of the figure at CEO endorsement), which is an excellent result.

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)**

A key component of the Project was the Biomass Support Unit (BSU). According to the ProDoc the BSU had the objective to facilitate the investments on agricultural and wood biomass energy projects, which due to various legal, institutional and financial barriers cannot attract enough financial resources from other sources. The BSU was setup in the Ministry of Mining and Energy (MoME) and was supposed to include permanent members from i) the other relevant ministries (Agriculture and Environmental Protection) and ii) external project partners from different institutions relevant for the Project (EBRD, Serbian Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency/Srem).

The BSU was set up at project start and had its first meeting in December 2014. Members of the BSU included the Ministry of Mining and Energy, Ministry of Agriculture and Environment Protection and UNDP Project Team. Between December 2014 and April 2017, the BSU carried out 14 meetings, for all of these meetings minutes were prepared. For a limited number of meetings, other institutions participated in the BSU meetings. Work in the BSU was described by stakeholders as constructive, but after the elections in early 2017 cooperation got difficult and no further meeting of the BSU was held.

During the evaluation mission it was voiced by different stakeholders that ad-hoc committees are being established to discussing issues or opportunities. However, it was also confirmed that extensive coordination between ministries, institutions, cities/municipalities and private sector would be helpful to further push the use of biomass in Serbia. As proposed in the ProDoc, other ministries or institutions active in biomass in Serbia should have been involved in the BSU on a permanent basis. This is a missed opportunity, as pursuing the initially envisaged design would have created the opportunity to set-up a structure, which could be helpful in coordinating initiatives on biomass in Serbia.

The MTR concluded that there was no need for the BSU to continue its operation after the project life time and that there will be no source of funding for the BSU. This argumentation is difficult to follow for 2 reasons:

- i) There is a strong need for coordination between stakeholders in the biomass sector for various reasons, such as coordinating activities and work focuses, exchanging experience on pilot projects, coordinating views on topics like auctioning for electricity from renewable energy.
- ii) There was no funding for the BSU in the beginning, so an argument that no financing is available is not valid.

The Project Team successfully created excellent working relationships with all relevant stakeholders, including:

- Ministry of Mining and Energy
- Ministry of Agriculture and Environmental Protection (at the time of CEO endorsement, now Ministry of Agriculture, Forestry and Water Management)
- Standing Conference of Towns and Municipalities
- Regional Development Agency Srem
- Municipality of Alibunar
- Private investors
- Commercial banks
- Chamber of Commerce

The Institute for Standardization of Serbia was originally envisaged as a partner in the Project. As they received support in translation of standards from GIZ, their participation in the Project was not required.

### **Feedback from M&E activities used for adaptive management**

The key recommendations of the Project's mid-term review conducted in February 2017 included the following:

**Recommendation 1: Make changes to the current project log-frame with the following objectives:** a) Retain outputs and activities that are relevant to the Project; b) Reduce the targets for some indicators (like number of seminars or studies) and modify activities so that they have relevance to the Project overall objective and outcomes; c) set targets so that they are achievable and realistic within the timeframe of the Project.

The suggested changes to the project logframe were made.

### **Recommendation 2: Focus on strengthening monitoring and evaluation of supported biogas plants.**

The Project has been monitoring the GHG emission reductions in all 6 plants and has presented a report in January 2019 on "Monitoring of the direct Greenhouse Gas Emission Reduction Impact by the Supported Pilot Projects". The report contains information on the electricity and heat generation in 2017 (from the 5 plants operational in 2017) and calculates the GHG emission reductions achieved in 2017 as well as over a period of 20 years (based on the 2017 figures).

### **Recommendation 3: Strengthen outreach to municipalities, regional development agencies and private sector agro-businesses for promoting biomass potential in the sector.**

The Project intensified the work with municipalities and published a call for municipalities and city municipalities with population between 20,000 and 40,000 inhabitants to elaborate municipal biomass balances and biomass programs was published and 29 municipalities were selected. The methodology developed will be basis for future investments of boilers in kindergartens, schools, public buildings, 3 best examples were identified for Public Private Partnership (PPP) in primary and

secondary schools, pre-feasibility studies were developed. On agro-businesses, a position paper related to the use of agriculture biomass as energy source in Serbia was elaborated.

**Recommendation 4: For any future engagement of project staff and assistance to project partners clear targets and deliverables should be defined and achieved under the Project management and control.**

The recommendation was considered. Experts were only hired based on consultancy contracts, which allowed the Project better management and control.

**Recommendation 5: Request a no-cost extension for 12 months to allow for monitoring implementation of pilot projects, as well as project's indirect impacts, including GHG emissions reductions**

No-cost extension was proposed, project end-date was moved to May 2019.

## Project Finance

The following table gives an overview on the project budget and expenditures from project start in May 2014 to December 2018. At the time of the Terminal Evaluation (March 2019), only US\$ 181,924 were not spent yet and were planned to be spent until end of Project.

**Table 3: Total Project Budget and Expenditures (in US\$)**

Outcome	2014	2015	2016	2017	2018	Total expenditure
Outcome 1:	44,783	79,928	63,057	80,869		268,637
Outcome 2:	799	20,561	30,958	79,847	248,306	380,471
Outcome 3:	2,466	108,990	30,891	108,536	104,430	355,313
Outcome 4:	-	480,000	771,456	192,864	132,571	1,576,891
Outcome 5:	356	4,800	9,811	27,321	155,680	197,968
Outcome 6:	-	-	-	6,272	40,656	46,927
Project Management	10,218	43,831	28,927	26,379	37,515	146,871
<b>Total</b>	<b>58,621</b>	<b>738,110</b>	<b>935,100</b>	<b>522,088</b>	<b>719,158</b>	<b>2,973,076</b>

The following table shows the project expenditures by budget lines and compares plan and actual.

**Table 4: Project expenditures by budget lines (in US\$)**

	Plan	Actual	Deviation
International Consultants	238,000	157,192	80,808
Local consultants	438,250	167,091	271,159
Contractual services – individuals	464,000	480,779	-16,779
Contractual services – companies	147,750	351,292	-203,542
Grant	1,600,000	1,600,000	0
Micro capital grant		50,000	-50,000
Direct Project Costs	7,000	6,552	448
Communication	40,000	9,107	30,893
Office supplies	19,000	5,177	13,823

Travel	152,000	108,080	43,920
Miscellaneous	39,000	36,534	2,466
Equipment and Furniture	0	0	
Professional services	10,000	1,272	8,728
Printing and publication costs	0	0	
<b>Total</b>	<b>3,155,000</b>	<b>2,973,076</b>	<b>181,924</b>

After getting operational, the Project had a good start with expenses and disseminated 56% of the funds in the first 2 years of full operation (2015 and 2016). These were mainly funds related to the Investment Grant Mechanism under Outcome 4. In general, there was a quite even dissemination of funds over the year due to the continuous work under the various outcomes of the Project.

When looking at individual budget lines (e.g. international consultants, national consultants, travel,...) there are only slight deviations between ProDoc and actual expenditures, which is a good result for a project where the ProDoc was developed already 6 years ago. This indicates that there was good and tight financial management.

During the preparation phase, the Project has received co-financing commitments from UNDP, Serbian government institutions, specialized organizations, municipalities and municipal associations and private investors. Co-financing commitments were a total of US\$ 27.63 million, out of which US\$ 24.11 (87.3%) million were committed in cash, with the majority of contributions from private sector. US\$ 3.52 (12.7%) million were committed in-kind. The following table gives an overview on co-financing commitments at CEO Endorsement and project end.

**Table 5: Co-financing at CEO Endorsement and project end**

Table 9: Co-financing at CEO Endorsement and project end				
Sources & type of co-financing	Name of co-financer	Amount confirmed at CEO Endorsement	Actual amount Contributed at project end - projection (May 2019)	Actual % of expected amount
		US\$	US\$	
CASH				
GEF Agency	UNDP	250,000	250,000	100.0%
Private	Private Investors	23,800,000	22,655,380	95.2%
	TOTAL CASH	24,050,000	22,905,380	95.2%
IN- KIND				
GEF Agency	UNDP	310,000	310,000	100.0%
GOVERNMENT	Government of Serbia	1,800,000	1,800,000	100.0%
OTHERS	Chamber of Commerce and Industry of Serbia	440,000	440,000	100.0%
OTHERS	Standing Conference of Towns and Municipalities	300,000	300,000	100.0%
OTHERS	Regional Development Agency Srem	50,000	50,000	100.0%
OTHERS	Municipality of Alibunar	100,000	120,000	120.0%



<b>OTHERS</b>	Municipality of Ruma	340,000	0	0.0%
<b>OTHERS</b>	Institute for Standardization	240,000	0	0.0%
	<b>TOTAL IN-KIND</b>	3,580,000	3,020,000	84.4%
<b>ADDITIONAL CO-FINANCING LEVERAGED</b>				
<b>GOVERNMENT</b>	Government of Finland Joint conference in 2015 and support to study tour to Finland 2015	0	75,000	N/A
<b>GOVERNMENT</b>	Government of Slovakia Joint conference in 2016	0	7,000	N/A
<b>OTHERS</b>	Enerstena Group Lithuania support to study tour to Lithuania 2018	0	35,000	N/A
	<b>TOTAL ADDITIONAL CO-FINANCING</b>	0	117,000	
	<b>TOTAL</b>	27,630,000	26,042,380	94.3%

Co-financing commitments in cash from private sector at CEO Endorsement were given by 6 different companies and totaled US\$ 23.8 million. Interestingly, none of these companies finally received a grant funding for implementation, still, cash co-financing commitments of private sector reached US\$ 22.7 million (95% of the expected figure). This is an excellent example of adaptive management and shows the high quality of work delivered under this Project. In total, co-financing commitments from all partners are US\$ 26.0 million (94.3% of the figure at CEO endorsement), which is an excellent result.

### Monitoring and evaluation: design at the entry and implementation (\*)<sup>2</sup>

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 the Project Inception Workshop, annual Project Implementation Reviews (PIRs), periodic monitoring through site visits and the project Mid-Term Review. The Monitoring and Evaluation design at entry can be considered as **Satisfactory (S)**.

The MTR concluded that the Project has harmonised the UNDP general M&E framework with GEF Project Results Framework what resulted in a document: "Project Monitoring and Evaluation Plan for the Project "Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia". It recommended improving further monitoring and verification of GHG emission at all 6 plants during the remaining project lifetime by collecting and analysing actual operational data from all 6 biogas plants as well as keeping an eye on progress with achievement of all project indicators.

The MTR noted that there was *"an error in calculating the emission reduction target as determined during project implementation so the figures need to be checked"*, however, the MTR Report failed to provide a correction of the emission reduction target, which was based on inconsistencies of the ProDoc. In the Project Results Framework, the Project Objective was defined as *"at least 3 MW of installed capacity support by this project fully operation by end of the project"*.<sup>3</sup> The calculations in Annex 8.4 however are based on an assumed installed capacity of 6.9 MW, which was the total

<sup>2</sup> 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)

<sup>3</sup> The ProDoc by mistake mentions a target of 4 MW under Outcome 4.

capacity of the projects, which expressed interest to join the GEF Project, but not the Project Objective of 3 MWe.

With a Project Objective of 3 MWe, an annual emission reduction of 23,126 tCO<sub>2</sub> can be achieved from the electricity generated (based on an 80% load factor and a grid emission factor of 1.1 tCO<sub>2</sub>/MWh). The GHG emission reduction over 20 years is 462,528 tCO<sub>2</sub>. For heat production, it can be assumed that every MW of electric capacity is providing 1.2 MW of heat. The annual emission reduction from heat is 8,073 tCO<sub>2</sub> (based on a load factor of 80% and an emission factor of 0.32 tCO<sub>2</sub>/MWh), the GHG reduction over 20 years is 161,464 tCO<sub>2</sub>. Electricity and heat generated are jointly reducing 31,200 tCO<sub>2</sub> per annum and 623,992 tCO<sub>2</sub> over a period of 20 years. As a consequence, this figure should be applied as the correct figure for the Project Goal.

The Project has been monitoring the GHG emission reductions in all 6 plants and has presented a report in January 2019 on “Monitoring of the direct Greenhouse Gas Emission Reduction Impact by the Supported Pilot Projects”. The report contains information on the electricity and heat generation in 2017 (from the 5 plants operational in 2017) and calculates the GHG emission reductions achieved in 2017 as well as over a period of 20 years (based on the 2017 figures).

Keeping an overview on progress with achievement of all project indicators was proven by the detailed comments on each of the indicators given in the 2017 and 2018 PIRs. By taking into account all of the above, the rating for project’s monitoring and evaluation is considered as **Highly Satisfactory (HS)**.

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

The Project was implemented based on the UNDP National Implementation Modality (NIM). The project management arrangements were slightly amended after the finalisation of the project inception report to reflect the new composition of the Government of Serbia and revised arrangements for implementation of the Investment Grant Support Mechanism due to the withdrawal of EBRD. As both the Ministry of Mining and Energy and Ministry of Agriculture and Environmental Protection have signed Project Document, both Ministries nominated their members for the Project Board. Ministry of Mining and Energy has been appointed as the Leading Executive Ministry has been appointed the. Further, to ensure inclusion of additional financing partners, local banks, in the implementation of the Investment Grant Support Mechanism, BSU was tasked to undertake regular consultation and coordination of relevant Project activities with financial institutions. According to stakeholders, the Project Board has been duly involved and regularly consulted on all important decisions and their views have been taken into account and their approval sought before the final decision.

Day-to-day management of the Project was carried out by a Project Management Unit (PMU) that was independent of but answerable to the Executing Agency (MoME) and both supported and overseen by the GEF Implementing Agency (UNDP Serbia). A Project Board has been established, which consists of Ministry of Mining and Energy, Ministry of Agriculture, Forestry and Water Management, UNDP Serbia and the PMU. The Project Board held 8 meetings during the course of the Project with MoME, UNDP and PMU participating in all meetings.

Unfortunately, it was not possible to involve other Ministry fully into the implementation of the Project. The Ministry of Agriculture, Forestry and Water Management was a full partner in the Project Board, but only participated in a limited number of meetings. After the elections in 2016, the Ministry of Agriculture and Environmental Protection, which was the original partner and signed the Project

Document, was split into a Ministry of Agriculture and a Ministry of Environmental Protection. Despite efforts, it was not possible to involve the Ministry of Environmental Protection in the implementation of the Project. Also, the BSU played a smaller role than originally envisaged, with meetings only being held until April 2017. This is a missed opportunity, as pursuing the initially envisaged design would have created the opportunity to set-up a structure, which could be helpful in coordinating initiatives on biomass in Serbia.

The support of UNDP, as the Implementing Agency through its Country Office, has been strong and effective throughout project implementation. The Project mastered serious challenges such as the withdrawal of EBRD or the withdrawal of all private sector partners, which provided co-financing commitments before project start. This shows the high quality of work from UNDP and the PMU, which qualifies for a **satisfactory (S)** rating.

## 5.3 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 6: Progress towards Results Matrix**

Project Strategy	Indicator	Baseline Level	End-of-project Target	End-of-project Status	Rating	Justification for Rating
Project Goal Reduction of GHG emissions associated with electricity generation in Serbia	GHG emission reductions, achieved during project lifetime, from project-supported installation and operation of biomass	Zero	At 1,247,481 tonnes of CO <sub>2</sub> equivalent will be achieved over the lifetime of the investments of 20 years from projects supported by the UNDP GEF project.  There was a calculation mistake in the GHG calculation of the ProDoc, which was based on the wrong installed capacity (see section on monitoring and evaluation). The correct target is 623,992 tCO <sub>2</sub> .	The biomass installations financed by the Project will achieve a total emission reduction of 1,054,000 tCO <sub>2</sub> over the period of 20 year, thereby overachieving the target by around 69%. Calculations are based on monitored electricity generation in 2017 and are assuming that 30% of the heat generated can be used. For the third Bac project (which only started operation in 2018), the average output of the other 2 Bacs plants was assumed. For the Forkom project, a load factor of only 60% was assumed for conservativeness.	HS	The Project has overachieved the target by 69%. Electricity generation alone will generate emission reductions of 970,000 tCO <sub>2</sub> over a period of 20 years, which is 55% over the target.
Project Objective To reduce barriers to accelerate the development of biomass markets in Serbia	Installed capacity of incremental biomass projects, substituting fossil fuel-based heating, supported by the project	Zero	At least 3 MW of installed capacity support by this project fully operation by end of the project  Direct greenhouse gas emission reductions totaling 1.2 million tonnes of CO <sub>2</sub> equivalent will be achieved over the lifetime of the investments of 20 years	The Project managed to implement biogas projects with a total installed capacity of 6.32 MW in 6 projects. 2 investors are currently implementing additional projects, which will add another 2.6 MW of capacity by end of 2020, bringing the total installed capacity to 8.92 MW.	HS	The Project managed to install more than double of the expected capacity (6.32 MW vs 3 MW) by end of the Project. Additional capacity additions initiated by the Project, which will be implemented after end of the Project, will bring the installed capacity to almost triple of the Project Objective.

Outcome 1 Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia	Established Biomass Support Unit	No Biomass Support Unit	Biomass Support Unit staffed and in full operation with funding to continue after project ends	The Biomass Support Unit has been staffed and in operation from project start until April 2017. Since then, no meeting was held and BSU will not continue after the project ends.	MU	As proposed in the ProDoc, other ministries or institutions active in biomass in Serbia should have been involved in the BSU on a permanent basis. This is a missed opportunity, as pursuing the initially envisaged design would have created the opportunity to set-up a structure, which could be helpful in coordinating initiatives on biomass in Serbia. Also, as the BSU didn't receive funding, the argument of lack of funding for stopping operation of the BSU is not valid.
	Training Modules and seminars on Biomass Energy for local municipalities and entrepreneurs based upon the UNDP Municipal Biomass Guide	No training or study courses on Biomass to Energy issues Not existing guidance in development of biomass projects or previous experience	At least 12 completed regional seminars on biomass energy that employed the designed training module will be presented	6 workshops on "Preparation and financing of projects of energy generation from renewable energy sources at agricultural holdings" were held between April and June 2018. 5 trainings on the potential, utilization and growing of energy crops were held between October and November 2018.	S	A total of 11 workshops was held compared to 12 regional seminars planned, which is a minor shortcoming.
	New course on Biomass Energy at the University of Belgrade & Novi Sad	Currently no training or study courses on Biomass to Energy issues	Established courses on biomass at Uni Belgrade and Novi Sad	3 on-site trainings for students of Belgrade and Novi Sad Universities were held in Oct 2017, April 2018 and Oct 2018. A 4 <sup>th</sup> on-site training will be held in April 2019. University professors and students have been engaged as participants for the study visits to the supported biogas plants in	S	Training courses have carried out in the form of on-site training for students. This gave students-first hand opportunity to learn from investors about the challenges in project implementation. Close contact between universities and operators has been established and training courses will be continued in future.

				order allow them to get acquainted with actually operating plants and to get first-hand information about the practical challenges and solutions in constructing and commissioning them.		
	Public awareness raising campaign on Biomass Energy	Limited awareness about climate change issues	Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia produced by the Biomass Support Unit	2 annual workshops have been organized and held in March 2015 and October 2016. The final workshop will be held in third week of March 2019.	S	Due to saturation of biomass related events, it was recommended to organize just one closing workshops at the end of project to present overall project results and to skip the 4 <sup>th</sup> workshop.
	Support material to facilitate investments <ul style="list-style-type: none"> <li>• Public awareness campaign</li> <li>• Annual International Workshop</li> <li>• e-trade platform</li> </ul>	Confusion about the meaning of bankable biomass project Lack of knowledge about biomass projects among local banks	Guidelines for the preparation of bankable projects that can be financed by EBRD and other international funds	Extensive material on investments into biomass projects have been developed and are available in Serbian and English on the project web site ( <a href="http://biomasa.undp.org.rs">http://biomasa.undp.org.rs</a> ) The website of the Chamber of Commerce (going live before project end) will contain extensive information on regulatory framework for biomass projects, guidelines for investors, pilot projects, contact details to companies active in the sector. 3 annual workshops have been held. E-trading platform will go live before end of the project.	HS	Extensive and high-quality material on investments in biomass in Serbia has been prepared and disseminated. Due to the Chamber of Commerce operating a new website which covers all this information, it can be secured that information will be kept up-to-date.

Outcome 2 Stronger and more effective secondary legislation related to biomass energy is developed and approved and adopted	Status of adoption of technical standards, policies and regulations for biomass projects and biomass supply (the exact list of regulatory documents to be developed and adopted – to be clarified at the Inception stage)	No standards or policies exist specifically for biomass projects	Proposed secondary legislation, technical standards, policies and regulations for biomass projects and biomass supply including required amendments to existing bylaws, technical standards and technical regulations for energy/power facilities.	3 critical government decrees were adopted in June 2016 to regulate an incentive mechanism for power producers from renewable energy, development was supported by the project in 2015-2016.  A methodology for monitoring the raw material consumption and energy production (both power and heat) for biomass/biogas CHP plants and the model report by privileged power producers to the competent ministry (complementing the Decree on Privileged Power Producers) were developed and adopted in 2017.	S	The project provided the required support to development of government decrees by providing legal support to the Ministry of Energy. Also, a methodology for monitoring the raw material consumption and energy production for biomass/biogas CHP plants and the model report by privileged power producers to the competent ministry were prepared with support by the project.
	Established licensing procedures	Lack of integrated licensing procedures	Appropriate licensing procedures biomass to energy systems are in place and investors have clarified and simplified process to follow	At project start it was concluded that adequate licensing procedures for biomass exist. The project has been working, on guidance, information sharing and training activities on licensing.	S	Adaptive management was successfully applied by working on guidance, information sharing and training activities on licensing, as licensing procedures were in place when the Project started.
Outcome 3 Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop,	Availability of National Programme for bio energy development in Serbia	No long-term National Programme for bio energy sector in Serbia	National Bio energy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Serbia	A National Renewable Energy Action Plan was already developed once the project started. As corrective action, 29 municipal biomass balances and biomass programs and plans were developed, which led to	HS	Adaptive management was successfully applied by preparing municipal biomass balances and biomass programs and plans.

finance, construct, and operate bankable biomass energy projects	Number of training seminars for banks and project developers	No dedicated training	At least 10 completed training seminars by the Biomass Support Unit for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the Investment Grant Mechanism	identification of 3 investment opportunities. Workshops have been held for banks and project developers to promote the Investment Grant Mechanism. Based on recommendation from MTR, 15 workshops for presenting opportunities provided by the IPARD II program (EU Instrument for Pre-Accession Assistance for Rural Development) with the emphasis on supporting biogas plants and plants using renewable energy sources were held in the period Jan-Apr 2018	HS	The number of workshops and trainings provided was over-achieved.
	Status of Investment Grant Mechanism	No Investment Grant mechanism	Operational criteria agreed with relevant stakeholders and investment grants released	The BSU has elaborated IGM mechanism and criteria for awarding the grants. Two public calls were open: one for the participating banks, and one for the interested investors with clear evaluation criteria presented.	HS	Operational criteria were agreed with relevant stakeholders and the investment grants were released to investors.
Outcome 4 Six biomass projects are successfully financed, constructed and operating by the end of the project  Technical viability of specific biomass technologies is	Investment grant mechanism	No investment grant mechanism	Investment grant mechanism established and successfully piloted by the end of the project Public support scheme for biomass projects established and is operational under the State Energy and	Grant agreements for six projects with total capacity of 6.32 MW were signed in December 2015. 5 of these projects with a capacity of 6.12 MW have been put into operation in 2017 and 2018, the last plant will start operation in April 2019.	HS	The Investment Grant Mechanism has been successfully implemented and projects supported are operating.



demonstrated as the basis for replication			Environment Fund by the end of the project			
	Bio energy projects	No bio energy projects, insufficient capacities	6 biomass projects of at least 4MW installed capacity (in total) are successfully financed, constructed and operating by the end of the project	The target for outcome 4 is not correct, it should be 3 MW to be consistent with the Project Objective. The Project managed to implement biogas projects with a total installed capacity of 6.32 MW in 6 projects. 2 investors are currently implementing additional projects, which will add another 2.6 MW of capacity by end of 2020, bringing the total installed capacity to 8.92 MW.	HS	The Project managed to install more than double of the expected capacity (6.32 MW vs 3 MW) by end of the Project. Additional capacity additions initiated by the Project, which will be implemented after end of the Project, will bring the installed capacity to almost triple of the Project Objective.
Outcome 5 At least 12 additional Biomass Projects are being supported by the Biomass Support Unit / Investment Grant Mechanism by the end of the Project	Number of new bio energy projects initiated in Serbia	No bio energy projects, insufficient capacities	At least 12 pre-feasibility for the new bio energy projects elaborated by the end of the project	Based on the work with municipalities, 3 new projects for use of biomass in municipalities have been identified. As part of the biomass potential study, which was established in cooperation with the Standing Committee on Cities and Municipalities and the Finnish Embassy, 2 new projects were identified and proposed to the Ministry of Mining and Energy. 1 additional biogas projects was implemented by the investors of the	MS	1 new project (1.6 MW installed capacity) will be put into operation in Q2/2019, 1 new project will be put into operation in 2020. A total of 5 other projects has been identified, but are only in very early stages.

				Bac projects, the Botos project will be extended by 1 additional biogas project.		
	Case Study or Documentary film on biomass	No recent films covering full supply to delivery chains	One film covering all the projects established during the project	1 short documentary film (5 min) titled "Biomass - energy all around us" and 1 long documentary film (30 min) about the Project and about the use of biomass for energy plants have been produced. Various short video clips were produced and uploaded to the website.	HS	Number of films produced exceeds expected target.

Applying an equal weight between all ratings, the Project would be between a HS and S rating. However, taking into account the outstanding performance of the project on Project Goal and Project Objective based on successful investments into biogas projects, the Overall Project Outcome Rating is clearly **Highly Satisfactory (HS)**.

### Relevance (\*)

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

- The Project was fully in line with the “Energy Sector Development Strategy of the Republic of Serbia for the Period by 2025 with Projections by 2030”. The strategy mentions the large biomass potential, sees opportunities in biogas co-generation facilities and envisages a strong role of biomass in contributing to an increase share of renewables in Serbia’s energy supply.
- Through the installation of 6 biogas projects, the Project has showcased the implementation of biogas for electricity generation, the projects implemented are excellent reference cases.
- The Project has held various awareness raising seminars on the benefits of biomass energy throughout Serbia through workshops, seminars, training events as well as international workshops.
- The Project has elaborated position papers (for example on energy crops and agricultural biomass), which will help in identifying sources of biomass to be used in various installations.
- The Project has increased the capacity of municipalities to understand demand and supply of biomass in their municipal territories by elaborating municipal biomass balances.
- The e-trading portal developed under the Project will set-up a platform for sellers and buyers of various forms of biomass.

It can be concluded that the Project was relevant for Serbia, which was strongly 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 Highly Satisfactory rating (HS) 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. This indicates that there was good and tight financial management.

The Project has shown adaptive management on several occasions. Due to the withdrawal of EBRD as partner for the Investment Grant Mechanism, the dissemination mechanism for the grant funding had to be revised. As UNDP was not allowed to directly

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contract with private sector participants, the Ministry of Mining and Energy took over this new role.

The target of the Project was to reach the installation of 3 MW biomass generation capacity and overall emission reductions of 624,000 tCO<sub>2</sub> with a grant component of US\$ 1.8 million. With the same amount of money, the Project managed to installed 6.32 MW of biomass generation capacity (over-performance of 110%) and achieve estimated GHG emission reductions of 1,054,000 (over-performance of 69%). The fact that co-funding by private sectors was slightly lower than expected in the ProDoc is confirming further the efficiency of implementation. Based on this, the rating for efficiency of the Project is **Highly Satisfactory (HS)**.

### Country Ownership

Country Ownership in the Project was high. There was a very strong interest of the Ministry of Mining and Energy to achieve tangible results by the Project. The NPD (National Project Director) took a very active role in the Project and was indispensable in overcoming key obstacles during project implementation. One of the key challenges was to find an appropriate structure for the setup of the Investment Grant Mechanism after the withdrawal of EBRD. The Ministry took over the key role of contracting with private entities based on the tender and managed challenges such as exchange rate risks.

The reduced interest of some governmental institutions was seen by stakeholders to be based more on personal and political reasons than lack of interest in supporting the increase use of biomass in Serbia.

Other institutions involved in the implementation of the Project, such as the Serbian Chamber of Commerce, the Standing Council of Cities and Municipalities or the Regional Development Agency of Srem were highly committed partners in the implementation of the Project. They were essential in working with municipalities, organizing workshops and seminars as well as identifying potential partners in the private sector.

### Mainstreaming

The Development Partnership Framework 2016-2020 for Serbia defined five main outcomes to set the direction of UN system development assistance for the years 2016 – 2020:

- Pillar I: Governance and Rule of Law
- Pillar II: Social and Human Resources Development
- Pillar III: Economic Development, Growth, and Employment
- Pillar IV: Environment, Climate Change and Resilient Communities
- Pillar V: Culture and Development

Renewable energy, including biomass plays a major role under Pillar IV “Environment, Climate Change and Resilient Communities” and the relevant Outcome 8: “By 2020, there are improved capacities to combat climate change and manage natural resources and communities are more resilient to the effects of natural and man-made disasters”.

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.

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## 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 certain **financial risks** to the sustainability of the outcomes of the Project. The biogas projects supported through the Investment Grant Scheme have all been able to secure a FIT (feed-in tariff) for a period of 12 years. After the end of this period, the projects will only receive the market price for electricity at that time, if no further support scheme is developed. This presents a risk for continuation of operation after 12 years, which would endanger the effects of the overall project, which has been calculated over a period of 20 years. The Ministry of Mining and Energy understands the need to find a solution for that situation and will be looking at prolonging the support through a (lower) FIT. Details of that support scheme will have to be elaborated over the coming years.

The investors into the biogas projects have all been active in securing additional income and benefits, which would have a positive impact to the financial sustainability of their investments. The key approach on the one hand is to find use for the heat generated by the projects (which is in MWh a multiple of the electricity generated), which otherwise has to be cooled. The approach to use the waste heat includes erection of greenhouses, dryers and heating/cooling of buildings.

Although the level of electricity prices after the end of the FIT is unknown, the additional benefits from heat use as well as changes on the supply side of raw material to be used should give a good basis for financial sustainability of the 6 biogas projects over the project lifetime of 20 years. Overall, financial sustainability is considered as **Likely (L)**.

There is an increased level of awareness on the opportunities of various forms of biomass (woody biomass, agricultural biomass, energy crops). Policy makers, decision makers on a municipal level and investors are well aware of the opportunities and as from a socio-economic point of view there is no barrier using the outcomes of the Project, the **socio-economic** sustainability is considered as **Likely (L)**.

The implementation of the Project has shown that there is an existing **institutional framework**, which is actively working on improving the use of biomass in Serbia. The National Renewable Energy Action Plan (NREAP) or the “Energy Sector Development Strategy of the Republic of Serbia for the Period by 2025 with Projections by 2030” are good indications for that. However, responses received in different interviews during the evaluation mission led to the conclusion that cooperation between ministries is working well on an expert level, but can be improved on a higher level. Despite this limitation, the sustainability of the institutional framework and governance is considered as **Likely (L)**.

Regarding **environmental risk**, there is limited exposure as long as wood and agricultural residues are being used. If there would be a rapid expansion of the biomass

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energy market and related rapidly growing demand for biomass fuels, the environmental risks cannot be entirely neglected, however. At the outcome level the environmental risks are considered as negligible. Therefore, the rating **Likely (L)** is given for environmental sustainability at the outcome level.

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

## Impact

The Project had a good impact on the situation of biomass in Serbia. Through the Project, 6.32 MW of new capacity of biogas were installed before project end. An additional 1.6 MW will be added without support from the Project before May 2019 and another 1 MW is planned to be added later this year and in 2020, so the Project will triple the projected target. Total GHG emission reductions are 70% higher than projected and are exceeding 1 million tons over a period of 20 years.

The Project had a very good impact on a municipal level, where decision makers in the 29 municipalities covered by the Project now understand the supply and demand situation of biomass in their municipalities, giving them the basis to work on implementation projects. Although there were some overlaps with other projects, trainings and workshops carried out during the Project were important in increasing the capacity of various stakeholders, including banks, investors or municipalities.

All these outcomes are very relevant for the country and would not be there without the Project. Therefore, impact is rated as **Significant (S)**.

## 6. CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNT

### 6.1 Summary of Ratings

The ratings given are summarized in Table 7 below.

**Table 7: Evaluation Ratings**

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

### 6.2 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 Reducing Barriers to accelerate the Development of Biomass Markets in Serbia Project. These are as follows:

- The final version of the Project Document was modified by several people and underwent various last-minute changes before receiving GEF approval. This led to conflicting targets (3 MW vs 4 MW installed capacity in the log frame), wrong calculations (GHG emission reduction calculations were based on 6.9 MW, lifetime GHG emission reductions were calculated in a detailed table Annex 8.4 to be 70,000 tons whereas the text talked about 1,247,481 tons) and other inconsistencies in the document. A final quality check of the document would help in increasing consistency and supporting a smooth start of project implementation.
- Due to elections and flooding in Serbia, the start of the Project was delayed from early 2014 to October 2014. More than 2 years had passed since work on the ProDoc had started and there was a time span of 16 months between first presentation of the ProDoc to GEF and project start. There were a number of developments in Serbia, which had an impact on the Project, such as development of the National Renewable Energy Action Plan, start of GIZ/KfW activities or work of the S2Biom Project on the Serbian Biomass Atlas. In such a situation, a critical, thorough review of outcomes, outputs and activities in the inception phase of the project is necessary. This was done only to a limited extent, as the PMU didn't want to – for obvious reasons – challenge outcomes and outputs of the newly started projects. For projects like these, support and guidance by experienced UNDP staff would be helpful in discussing and finally deciding whether modifications to the project can be made and to what extent these modifications should be made.

- The MTR Report noted that there was an error in calculating the emission reduction target as determined during project implementation, however, the MTR Report failed to provide a correction of the emission reduction target, which is based on inconsistencies of the ProDoc. A correction at that point in time would have been helpful for the PMU to receive a clear indication of what the actual target is.
- As in many other projects, the ProDoc included the adoption of policies and regulations as an output. Whereas projects can commit to work on policies and regulations, the adoption of these legal documents is in many cases not dependent on the quality of work provided by the project, but on political decisions. Projects should therefore be careful with the level of commitment when it comes to the legal framework.
- Biomass has become an interesting topic in Serbia over the recent years. A number of initiatives have been working on promoting the increased use of biomass for energy purposes, both for heat and electricity. A stronger coordination with other initiatives is necessary to avoid duplications. Adaptive management was applied by the PMU to avoid duplications on specific topics, however, coordination at a higher level is helpful to improve coordination.
- 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.

### 6.3 Actions to follow up or reinforce initial benefits from the project

There are a number of actions, which should be followed up to achieve sustainable benefits from the Project:

#### Recommendation #1

- As there are a number of initiatives and programs working on biomass in Serbia, coordination between various government players is important. In addition to ad-hoc committees, which are being established on emerging issues involving technical staff, regular coordination between ministries on the level of decision makers would be beneficial to further promote the increased use of biomass .

#### Recommendation #2

- Private sector has had an enormous contribution to the success of the Project. Without the perseverance of investors, their willingness to overcome new hurdles coming up and their ability to cover additional costs, only a small share of projects would have been implemented. The lessons learnt in the process of getting approvals on a municipal level and connecting to the electricity grid are extremely valuable. It would be important to invite private sector to share this experience with all relevant stakeholders, so implementation of new projects will become smoother. This project provides an excellent case study of how to work with the private sector that could be replicated in other countries and it is recommended to produce a detailed lessons learned study.

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### Recommendation #3

- It was discussed during the on-site mission that the Energy Community is requesting Serbia to apply auctioning for adding new renewable energy capacity to the grid. It is important to understand that biogas/biomass and other renewables such as solar PV or wind power cannot be compared. Among other reasons, biomass/biogas projects are delivering constant power to the grid (the Bac projects are achieving more than 8,000 full load hours), provide new work opportunities for local companies and people and in many cases use organic residues for generating electricity. It is advisable that biomass/biogas does not have to compete with other renewables under an auctioning scheme.

### Recommendation #4

- There are a number of new project opportunities, which are currently in an early stage. Based on the work with municipalities, 3 new projects for use of biomass in municipalities have been identified. As part of the biomass potential study, which was established in cooperation with the Standing Committee on Cities and Municipalities and the Finnish Embassy, 2 new projects were identified and proposed to the Ministry of Mining and Energy. These opportunities should be followed up by the Ministry of Mining and Energy in cooperation with the Standing Committee on Cities and Municipalities.

### Recommendation #5

- As mentioned in the report, biogas projects are not to produce electricity at current market rates of electricity due to the cost situation of input material. As a consequence, prolongation of a FIT (at lower level compared to current situation) should be pursued for projects currently under operation. Also, enforcing the current regulatory framework on organic waste would lead to a change in the price level of input material for biogas plant operators, which would be positive for the financial sustainability of these projects.

### Recommendation #6

- The e-trading platform, which was set-up as part of the Project, is an excellent opportunity for sellers and purchasers of various forms of biomass to meet and to create a transparent market. Sustaining this platform would be key factor for the viability of biomass projects in Serbia. This should be achieved – as envisaged by the Chamber of Commerce – by membership fees as well as revenues from selling advertisements. As the Chamber is running a number of platforms and can keep costs low, this looks feasible.

### Recommendation #7

- Other UNDP GEF projects in the region working on renewable energy projects and accelerating the development of renewable energy technologies should be invited to Serbia to see the excellent project results.

A main lesson learned from this project is that it is important to carry out adaptive management early in the project lifetime and not wait for the mid-term review to carry out adjustments. This project successfully carried out adaptive management early in the project which lead to some very good results in terms of mobilizing private sector investment.

## ANNEXES

### 6.4 TE ToR (excluding ToR annexes)

<b>Title:</b>	International Expert - Terminal Evaluation of the GEF Project: “Reducing Barriers to Accelerate the Development of Biomass Markets”
<b>Programme:</b>	GEF Project: “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”, PIMS No 4382
<b>Reporting to:</b>	Portfolio Officer
<b>Duty Station:</b>	Home based and at least one mission to Serbia
<b>Type of contract:</b>	Individual Contract (IC) or Reimbursable Loan Agreement (RLA) based on Long Term Agreement (LTA)
<b>Duration:</b>	15 February 2019 – 07 April 2019
<b>Estimated number of working days:</b>	24 working days

#### Background

##### **a. Purpose**

To undertake the terminal evaluation (TE), of the GEF Project: “Reducing Barriers to Accelerate the Development of Biomass Markets” (the Project), and to make recommendations that might improve further implementation of the Project.

##### **b. Objective**

To assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

##### **c. Background Information**

Since 2014 the United Nations Development Programme (UNDP), acting as an implementing agency of the Global Environment Facility (GEF), has been implementing together with the Ministry of Mining and Energy (MME) GEF Project: “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia” (<https://www.thegef.org/project/reducing-barriers-accelerate-development-biomass-markets-serbia>).

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With 2.85 m US\$ from the GEF, the Biomass Project will have a total volume of 30 m US\$. Co-financing is provided by Serbian institutions and private investors.

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 a Terminal Evaluation (TE) of the project “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia” (PIMS# 4382)

The essentials of the project to be evaluated are as follows:

Project Summary Table

Project Title:	Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia			
GEF Project ID:	4517		<u>at endorsement</u> <u>(Million US\$)</u>	<u>at completion</u> <u>(Million US\$)</u>
UNDP Project ID:	4382	GEF financing:	2.845	
Country:	Serbia	IA/EA own:	0.560	
Region:	Western Balkan	Government:	1.800	
Focal Area:	Climate Change	Other:	25.270	
FA Objectives, (OP/SP):	SP-4: Promoting Sustainable Energy Production from Biomass	Total co-financing:	27.630	
Executing Agency:	Ministry of Mining and Energy	Total Project Cost:	30.475	
Other Partners involved:	Ministry of Agriculture and Environmental Protection	ProDoc Signature (date project began):		May 29, 2014
		(Operational) Closing Date:	Proposed: May 29, 2018	Actual: June 9, 2019

The project was designed to reduce the GHG emissions associated with the electricity generation in Serbia by reducing barriers to and accelerating the development of the biomass market in Serbia. The specific outcomes of the project include: 1) Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia; 2) Stronger and more effective secondary legislation related to biomass energy is developed, approved and adopted; 3) Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects established; 4) Six biomass projects are successfully financed, constructed and operating by the end of the project and the technical viability of specific biomass technologies is demonstrated as the basis for replication; and 5) At least 12 additional

Biomass Projects are being supported by the Biomass Support Unit / Investment Grant Mechanism by the end of the Project.

The project is executed by the UNDP and MME in cooperation with the Ministry of Agriculture, Forestry and Water Management (former Ministry of Agriculture and Environmental Protection). Main external project partners are, the Chamber of Commerce and Industry of Serbia, the Standing Conference of Towns and Municipalities, the Institute for Standardization and Regional Development Agency Srem and banks.

### **Duties and Responsibilities**

The TE 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.

#### **a. TE Approach and Methodology**

An overall approach and methodology 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 (<http://www.undp.org/evaluation/handbook> Chapter 7, pg. 163). A set of questions covering each of these criteria has been drafted and are included with this TOR in 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, UNDP Country Office, Project Team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to Serbia, including the following project sites: Aleksinac, Alibunar, Bač, and Zrenjanin. Interviews will be held with the following organizations and individuals at a minimum: Ministry of Mining and Energy, Ministry of Agriculture and Environment, Serbian Chamber of Commerce, owners and managers of the supported biogas plants, representatives of those local municipalities where the biogas plants are operating and UNDP Serbia Country Office.

#### **b. Scope of Work**

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 such as Tracking Tool for Climate Change Mitigation Projects [https://www.thegef.org/sites/default/files/documents/GEF\\_CC\\_Mitigation\\_Tracking\\_Tool\\_rev\\_1\\_9-Sep-2013.xlsx](https://www.thegef.org/sites/default/files/documents/GEF_CC_Mitigation_Tracking_Tool_rev_1_9-Sep-2013.xlsx), project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the

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Project Team will provide to the evaluator for review is included in Annex B of this Terms of Reference.

### c. Evaluation Criteria and 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:	

### d. Project Finance / Co-finance

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. 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 Agencies (mill. US\$)		Private investors (mill. US\$)		Total (mill. US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants /cash	0.25						23.8		24.05	
Loans/Concessions	-									
In-kind support	0.31		1.8		1.47				3.58	
Other	-									
Totals	0.56		1.8		1.47		23.8		27.63	

### e. Mainstreaming

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UNDP supported 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.

#### **f. Impact**

The evaluator 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 (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.](#))

#### **g. Conclusions, Recommendations & Lessons**

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

### **Implementation Agreements**

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

### **Evaluation Timeframe**

The total duration of the evaluation will be 24 days according to the following plan:

Activity	Timing	Completion Date
<b>Preparation</b>	3 days	No later than 2 weeks before the evaluation mission.
<b>Evaluation Mission</b>	6 days	By 08 Mar. 2019
<b>Draft Evaluation Report</b>	12 days	Within 3 weeks of the evaluation mission
<b>Final Report</b>	3 days	Within 1 week of receiving UNDP comments on draft

### **Evaluation Deliverables**

The evaluator is expected to deliver the following:

Deliverable	Content	Deadline	Responsibilities
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<b>Inception Report</b>	Evaluator provides clarifications on timing and method	28 Feb. 2019	Evaluator submits to UNDP CO
<b>Presentation</b>	Initial Findings	End of evaluation mission	To project management, UNDP CO
<b>Draft Final Report</b>	Full report, (per annexed template) with annexes	30 Mar. 2019	Sent to CO, reviewed by RTA, PCU, GEF OFPs
<b>Final Report*</b>	Revised report	7 Apr. 2019	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.

Deliverables 1 and 2 will have to be reviewed and accepted by the Programme Officer and UNDP CO DRR.

Deliverables 3 and 4 will have to be reviewed and accepted by the Programme Officer, UNDP CO DRR and GEF Regional Technical Advisor.

## **Requirements**

### **Competencies**

- Consistently ensures timeliness and quality of project work.
- Demonstrates strong oral and written communication skills.
- Evidence of ability to express ideas clearly; to work independently and in teams.
- Ability to summarize and systematize complex information and identify priorities for follow up activities.
- Shares knowledge and experience.
- Focuses on results and responds positively to feedback.
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.
- Demonstrates integrity by modelling ethical standards.

### **Qualifications**

- An advanced university degree (MSc or higher) in the project related field; (mechanical/electrical/process/agriculture/forestry/environment engineering or economy);

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- Minimum 10 years of proven professional experience, preferably in energy/environmental sector since obtaining degree;
- Track record of professional international experience in project development/management/monitoring/evaluation in CC portfolio;
- Proven record of managed/developed GEF projects;
- Proven record on evaluated GEF projects;
- Good knowledge of international experiences, state of the art approaches and best practices in the specific areas the project and its subcomponents are dealing with;
- Experience in working with wide range of stakeholders (private, government, etc.);
- Broad understanding and knowledge of comparative experiences in implementation of EU legislation on energy efficiency and renewable energy sources.

### Language

- 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'](#)

## ANNEX A: PROJECT LOGICAL FRAMEWORK

### UPDATED LOGFRAME BASED ON MTR RECOMMENDATIONS (WITH HIGHLIGHTED CHANGES TO THE APPROVED LOGFRAME AT CEO ENDORSEMENT)

MTR Recommendation 1: Make changes to the current project log-frame with the following objectives: a) Retain outputs and activities that are relevant to the Project; b) Reduce the targets for some indicators (like number of seminars or studies) and modify activities so that they have relevance to the Project overall objective and outcomes; c) set targets so that they are achievable and realistic within the timeframe of the Project.

Suggested changes were elaborated in the MTR report and summarized below as well as in the table after that.

- Policy issues with wood and agro biomass should be elaborated with recommendations in two position papers
- IGM mechanism should be considered consumed. The new FIT system and upcoming EU Instrument for Pre-Accession Assistance in Rural Development (IPARD) lay solid foundation for sustainable support of RES utilization for energy production
- There is no justification for BSU operation beyond project lifetime
- Number of studies and seminars should be reduced and subjects refocused as discussed in the report
- Regulatory support work should address broader RES issues, such as energy plantations, agro waste to energy cycle, etc.

<i>Project component</i>	<i>End of project targets as defined in the Project Results Frameworks (PRF) attached to the Inception Report (IR)</i>	<i>Changes between the original PRF and the one in the IR</i>	<i>Component specific changes to the logframe suggested by the MTR</i>	<i>Project management response and suggested revised end of project targets</i>
<b>Project Goal:</b> Reduction of GHG emissions associated with electricity generation in Serbia	At 1,247,481 tonnes of CO <sub>2</sub> equivalent will be achieved over the lifetime of the investments of 20 years from projects supported by the UNDP GEF project		It seems that there was an error in calculating the emission reduction target as determined during project implementation, so the figures need to be checked. Intensify further monitoring and verification of emissions reduction based on the actual operational data that need to be collected during the remaining project implementation.	The updated direct GHG reduction analysis done on the basis of the projected annual power and heat generation of the granted 6 projects resulted in an updated direct GHG reduction target of 1,069,535 tons of CO <sub>2eq</sub> over 20 years (based on the figures provided in the feasibility studies of the supported projects).

				<p>Given the error of the GHG reduction analysis in the project document and the significant mismatch between capacity and the GHG reduction target of the planned pilot projects, it is suggested that the revised targets for the project goal and the project objective include:</p> <p>At least 3 MW of installed capacity supported by this project fully operation by end of the project</p> <p>Direct greenhouse gas emission reductions totaling <b>1 million tonnes</b> of CO2 equivalent will be achieved over the lifetime of the investments of 20 years, which will be subject to further monitoring and verification during the remaining project implementation.</p>
<b>Project Objective:</b> To reduce barriers to accelerate the development of biomass markets in Serbia	At least 3 MW of installed capacity supported by this project fully operation by end of the project  Direct greenhouse gas emission reductions totaling 1.2 million tonnes of CO2 equivalent will be achieved over the lifetime of the investments of 20 years		See the comments above on the erroneous GHG reduction target.	<p>The capacity target can remain and has already been passed with the total installed power generation capacity of 6.3 MWe</p> <p>For direct GHG reduction target see the comments above on the project goal target.</p>
<b>Outcome 1:</b> Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia	Biomass Support Unit staffed and in full operation with funding to continue after project ends		The funding for the operation of the BSU after project ends cannot be secured, and there is no need for BSU to continue its operation after the project life time.	The expected continuation of the BSU after the project to be removed from the log-frame as per the recommendations of the MTR. This target as a whole also to be transferred under Outcome 3, where it fits better.
	At least 12 completed regional seminars on biomass energy that employed the designed training module will be presented		The project should organize seminars pertinent to its follow up activities in the area of use of agro-waste, energy plantations, IPARD upcoming RES support, etc.	<p>Suggested revised target as per the recommendations of the MTR:</p> <p>At least 1 completed workshop or seminar organized on each of the following topics: i) agro-sector value chain and logistics to increase the use of</p>

			agro-waste for bioenergy production; ii) use of woody biomass and energy plantations for bioenergy production in Serbia; ii) bioenergy project financing (including Government RES support, IPARD, banks and private equity investors)
<del>Defined and adopted methodologies and respective databases</del>	<del>Removed in the revised IR - PRF.</del>		
Established courses on biomass at Uni Belgrade and Novi Sad		No courses have been established. In discussions with project director it transpires that introduction of new courses at a University requires due process and consideration of overall academic program as well as compatibility with existing subject. His opinion is that the biomass themes are well covered among existing subjects, hence we recommend removal of this Activity.	To be removed from the logframe as per the recommendations of the MTR.
Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia produced by the Biomass Support Unit		The first workshop was organized in March 2015. The second workshop was organized in October 2016. However, due to already mentioned saturation of biomass related events, it is recommended to organize just one closing workshops at the end of project to present overall project results.	To be revised as follows:  At least three international workshops organized during the implementation of the project, including the end-of-the project workshop.
<del>Guidelines for the preparation of bankable projects that can be financed by EBRD and other international funds</del>	<del>Removed in the revised IR - PRF.</del>		
<u>Biomass e-trading platform operational</u>	<u>Added into the revised IR-PRF</u>	The preparation of a business plan for the platform is on-going. An important output of the business plan should be an assessment of available resources which would be traded via platform and interest of the 'owners' of resources to offer them	Suggested revision: Biomass e-trading platform operational with a set-up likely to ensure its sustainability also after the project end.

			for trading thus providing for liquidity of the e-market	
<b>Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed and approved and adopted</b>	Proposed secondary legislation, technical standards, policies and regulations <u>for biomass projects and biomass supply including required amendments to existing bylaws, technical standards and technical regulations for energy/power facilities</u> ; <del>are adopted and implementation documents by the end of the project</del>	Changes in the revised IR-PRF (compared to the original PRF) highlighted	The project has provided assistance to the Ministry of Mining and Energy by hiring a legal person which sits at the Ministry. However, no specific regulations and other legal documents contributing to this target were developed. Therefore, this assistance should be cancelled, and for any future assistance clear targets and deliverables should be defined and achieved under the Project management and control. Potential areas for development could be for geothermal energy use, for water use for irrigation, for energy plantations, for collecting of agro-waste by bio gas plants, etc.	Suggested revision as per the recommendations by the MTR:  At least two position papers to be finalized by the end of the project: i) On issues related to wood biomass use; ii) on issues related to agro biomass, waste and effluents.
	Appropriate licensing procedures biomass to energy systems are in place and investors have clarified and simplified process to follow		According to project management, appropriate licensing procedures for bioenergy plants are already in place and do not require specific project support. However, the project has prepared a guide to investors clarifying licencing and permitting process.	To be removed from the logframe
<b>Outcome 3:</b> Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate	National Bioenergy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Serbia		Project has not prepared a strategy or action plan, because strategic documents exists like Action plan for biomass, National renewable action plan (NREAP), Energy strategy. It is recommended for the Project to prepare two position papers: i) On issues related to wood biomass use; ii) on issues related to agro biomass, waste and effluents.	Suggested revision: To be removed from the logframe and the two positions papers to be included as targets under Outcome 2
	At least <del>20</del> 10 completed training seminars by the Biomass Support Unit for	The amount of seminars	As said already, there is saturation with number of courses on the biomass subject	To be removed from the updated logframe (substance included into the

bankable biomass energy projects	Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the Investment Support Mechanism	reduced from 20 to 10 in the revised IR- PRF	for all target groups. Project should consider preparing some targeted workshops for use of agro biomass and waste, once the supported plants are operational. IPARD program will support small-scale biomass project, and that could be a subject to promote as presently available investment support mechanisms.	revised Outcome 2 target on workshops and seminars).
	Operational criteria agreed with relevant stakeholders and investment grants released			Not a relevant outcome target. To be removed from the updated logframe.
<b>Outcome 4:</b> Six biomass projects are successfully financed, constructed and operating by the end of the project.  Technical viability of specific biomass technologies is demonstrated as the basis for replication	Investment grant mechanism established and successfully piloted by the end of the project			To be maintained in the logframe (already achieved)
	<del>Public support scheme for biomass projects established and is operational under the State Energy and Environment Fund by the end of the project</del>	Removed in the revised IR- PRF		
	6 biomass projects of at least 4MW installed capacity (in total) are successfully financed, constructed and operating by the end of the project			To be maintained in the logframe, but the monitoring needs and the required monitoring report o be added
<b>Outcome 5:</b> At least 12 additional Biomass Projects are being supported by the Biomass Support Unit / Investment Grant Mechanism by the end of the Project	At least 12 <del>new bio energy projects designed with financial closure reached pre-feasibility for the new bio energy projects elaborated</del> by the end of the project	Changes in the revised IR-PRF highlighted	The project should diversify away from FIT eligible installations towards IPARD eligible installation and could promote certain number of IPARD eligible projects	At least 2 model proposals finalized for IPARD support with the project expert assistance (to be selected by a public call of proposals) together with the related on-the-job training of the local stakeholders and practical guidance for finalizing further proposals of similar kind.
	One film covering all the projects established during the project			To be maintained (already achieved)

**ANNEX B: LIST OF DOCUMENTS TO BE REVIEWED BY THE EVALUATORS**

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Project document and the CEO Endorsement Request

Inception report

Annual Project Implementation Reviews

Project Midterm Review report and the Management Response to that

Minutes of the Project Board Meetings

Minutes of Biomass Support Unit (BSU) meeting

Annual work plans and financial reports ‘

Annual monitoring reports of the supported biogas plants

Draft final report of the project

Any other documents and materials produced during the project implementation that are required to assess to what extent the specific project outputs and targets have been achieved

## ANNEX C: EVALUATION QUESTIONS

Evaluative Criteria Questions	Indicators	Sources	Methodology
<b>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?</b>			
•	•	•	•
•	•	•	•
•	•	•	•
<b>Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?</b>			
•	•	•	•
•	•	•	•
•		•	•
<b>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</b>			
•	•	•	•
•	•	•	•
•	•	•	•
<b>Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?</b>			
•	•	•	•
•	•	•	•
•	•	•	•



Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?			
•	•	•	•
•	•	•	•

## ANNEX D: RATING SCALES

<p><b><i>Ratings for Outcomes, Effectiveness, Efficiency, M&amp;E, I&amp;E Execution</i></b></p> <p>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</p>	<p><b><i>Sustainability ratings:</i></b></p> <p>4. Likely (L): negligible risks to sustainability  3. Moderately Likely (ML): moderate risks  2. Moderately Unlikely (MU): significant risks  1. Unlikely (U): severe risks</p>	<p><b><i>Relevance ratings</i></b></p> <p>2. Relevant (R)  1.. Not relevant (NR)</p> <p><b><i>Impact Ratings:</i></b></p> <p>3. Significant (S)  2. Minimal (M)  1. Negligible (N)</p>
<p><b><i>Additional ratings where relevant:</i></b></p> <p>Not Applicable (N/A)  Unable to Assess (U/A)</p>		

## ANNEX E: EVALUATION CONSULTANT CODE OF CONDUCT AND AGREEMENT 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<sup>4</sup>

#### Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: \_\_\_\_\_

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 *place* on *date*

Signature: \_\_\_\_\_

<sup>4</sup>[www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)

**ANNEX F: EVALUATION REPORT OUTLINE<sup>5</sup>**

- 
- i. Opening page:
    - Title of UNDP supported GEF financed project
    - UNDP and GEF project ID#s.
    - Evaluation time frame and date of evaluation report
    - Region and countries included in the project
    - GEF Operational Program/Strategic Program
    - Implementing Partner and other project partners
    - Evaluation team members
    - Acknowledgements
  - ii. Executive Summary
    - Project Summary Table
    - Project Description (brief)
    - Evaluation Rating Table
    - Summary of conclusions, recommendations and lessons
  - iii. Acronyms and Abbreviations  
(See: UNDP Editorial Manual<sup>6</sup>)
  - 1. Introduction
    - Purpose of the evaluation
    - Scope & Methodology
    - Structure of the evaluation report
  - 2. Project description and development context
    - Project start and duration
    - Problems that the project sought to address
    - Immediate and development objectives of the project
    - Baseline Indicators established
    - Main stakeholders
    - Expected Results
  - 3. Findings  
(In addition to a descriptive assessment, all criteria marked with (\*) must be rated<sup>7</sup>)
  - 3.1 Project Design / Formulation
    - Analysis of LFA/Results Framework (Project logic /strategy; Indicators)
    - Assumptions and Risks
    - Lessons from other relevant projects (e.g., same focal area) incorporated into project design
    - Planned stakeholder participation
    - Replication approach
    - UNDP comparative advantage
    - Linkages between project and other interventions within the sector
    - Management arrangements
  - 3.2 Project Implementation
    - Adaptive management (changes to the project design and project outputs during implementation)
    - Partnership arrangements (with relevant stakeholders involved in the country/region)
    - Feedback from M&E activities used for adaptive management
    - Project Finance:

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<sup>5</sup>The Report length should not exceed 40 pages in total (not including annexes).

<sup>6</sup> UNDP Style Manual, Office of Communications, Partnerships Bureau, updated November 2008

<sup>7</sup> Using a six-point rating scale: 6: Highly Satisfactory, 5: Satisfactory, 4: Marginally Satisfactory, 3: Marginally Unsatisfactory, 2: Unsatisfactory and 1: Highly Unsatisfactory, see section 3.5, page 37 for ratings explanations.

- Monitoring and evaluation: design at entry and implementation (\*)
  - UNDP and Implementing Partner implementation / execution (\*) coordination, and operational issues
- 3.3** Project Results
- Overall results (attainment of objectives) (\*)
  - Relevance(\*)
  - Effectiveness & Efficiency (\*)
  - Country ownership
  - Mainstreaming
  - Sustainability (\*)
  - Impact
- 4.** Conclusions, Recommendations & Lessons
- Corrective actions for the design, implementation, monitoring and evaluation of the project
  - Actions to follow up or reinforce initial benefits from the project
  - Proposals for future directions underlining main objectives
  - Best and worst practices in addressing issues relating to relevance, performance and success
- 5.** Annexes
- ToR
  - Itinerary
  - List of persons interviewed
  - Summary of field visits
  - List of documents reviewed
  - Evaluation Question Matrix
  - Questionnaire used and summary of results
  - Evaluation Consultant Agreement Form

**ANNEX G: EVALUATION REPORT CLEARANCE FORM**

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*(to be completed by CO and UNDP GEF Technical Adviser based in the region and included in the final document)*

Evaluation Report Reviewed and Cleared by

UNDP Country Office

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

UNDP GEF RTA

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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

Evaluative Criteria Questions	Indicators	Sources	Method
<b>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?</b>			
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 CO <sub>2</sub>	Project reports, calculations of GHG emission reductions from pilot projects	Literature Review (LR), Interviews (I)
<b>Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?</b>			
Are the achieved project outcomes in line with the original or modified project objectives?	GHG emission reductions in tons of CO <sub>2</sub> , 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)
<b>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</b>			
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 Executing Agency in meeting the requirements set out in UNDP	Contribution of UNDP and Executing Agency toward project progress	Project reports, stakeholders	Literature Review (LR), Interviews (I)

Programme and Operations Policies and Procedures?			
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)



## 6.6 Ratings Scales

<b>Ratings for Outcomes, Effectiveness, Efficiency, M&amp;E, I&amp;E Execution</b> 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	<b>Sustainability ratings:</b> 4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML): moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	<b>Relevance ratings</b> 2. Relevant (R) 1.. Not relevant (NR)  <b>Impact Ratings:</b> 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
<b>Additional ratings where relevant:</b> Not Applicable (N/A) Unable to Assess (U/A)		

## 6.7 TE mission itinerary

### Tuesday, March 12<sup>th</sup>

**09.00 – 10.00:** Meeting with the UNDP project team

Participants: Manfred Stockmayer and UNDP project team

Venue: CCIS, Resavska 13-15, office 410

**10.00 - 11.15:** Meeting with the representative of Ministry of Mining and Energy representative

Participants: Manfred Stockmayer, Antonela Solujic (Senior Advisor) and Maja Matejic (UNDP Portfolio Manager-Energy)

Venue: CCIS, Resavska 13-15, office 410, Belgrade

**11: 30 - 12.00:** Meeting with the representative of Ministry of Agriculture, Forestry and Water Management (MAFWM)

Participants: Manfred Stockmayer and Dusan Jovic (member of Biomass Support Unit and Senior Advisor in MAFWM)

Venue: CCIS, Resavska 13-15, office 410, Belgrade

Topic: Cooperation between UNDP and Directorate of Forests (participation in BSU, etc.)

**12.15 -13.15:** Meeting with the representatives of investors and Biogas Association

Participants: Manfred Stockmayer, Danko Vukovic (investor and biogas association representative), Ivan Radovic (investor), Zoran Pomoriski (investor), Dragan Zukic (representative Biogas Association), and UNDP project team

Venue: Chamber of Commerce and Industry of Serbia, Belgrade, Resavska 13-15, office 410

Topic: Grants for the construction of biomass/biogass fired combined heat and power facilities (Poblems and challenges that were identified and faced by investors since the moment of deciding to initiate the project until its finalisation; Impact of grants)

**13.15 – 14.15:** Lunch break

14.30- 15.00: Meeting with Aleksandar Bogunovic, representative of Chamber of Commerce and Industry of Serbia (former member of BSU from the Ministry of Agriculture and Environmental Protection/Sector for Rural Development, Senior Advisor)

Participants: Manfred Stockmayer and Aleksandar Bogunovic (Head of Department for Agriculture in CCIS)

Venue: CCIS, Resavska 13-15, office 410, Belgrade

Topic: Workshops for preparation and financing of Renewable energy projects in agriculture

**15.00 – 15.45:** Meeting with GFA team

Participants: Manfred Stockmayer, Zoran Kapor (GFA, Managing Director), Branko Glavonjic (Professor, Faculty of Forestry, University of Belgrade) and UNDP project team

Venue: CCIS, Resavska 13-15, office 410

Topic: Elaboration of biomass annual balance, biomass programmes and plans for 29 selected municipalities, (Public Call for municipalities)

**15.45-16.15:** Meeting with Branko Glavonjic

Participants: Manfred Stockmayer, Branko Glavonjic and UNDP project team

Venue: Chamber of Commerce and Industry of Serbia, Resavska 13-15, office 410

Topic: Position paper related to the use of wood biomass as energy source in Serbia

**16.15 – 17.15:** Meeting with the UNDP project team

Participants: Manfred Stockmayer and UNDP project team

Venue: CCIS, Resavska 13-15, office 410

**Wednesday, March 13<sup>th</sup>****09.00-17.00:** Field visit to CHP facility in Bac Municipality

Participants: Manfred Stockmayer, representatives of investors and UNDP project team

Topic: Grants for the construction of biomass/biogass fired combined heat and power facilities

**Thursday, March 14<sup>th</sup>****10.00-10.30:** Meeting with the representative of Regional Development Agency (RDA) of Srem

Participants: Manfred Stockmayer, Milan Miric (Director of RDA Srem) and UNDP project team

Venue: CCIS, Resavska 13-15, office 410, Belgrade

Topic: Cooperation between UNDP project and RDA Srem (Project partner)

**10.30-11.00:** Meeting with the representative Standing Conference of Towns and Municipalities

Participants: Manfred Stockmayer, Miodrag Gluscevic (Head of Dept for Communal Services, Urban Planning and Environment) and UNDP project team

Venue: CCIS, Resavska 13-15, office 410, Belgrade

Topic: Cooperation between UNDP project and SCTM (Project partner)

**11.30 - 12.30:** Meeting with Milos Banjac, Assistant Minister and National Project Director, Ministry of Mining and Energy

Participants: Manfred Stockmayer, Milos Banjac and Maja Matejic

Venue: Ministry of Mining and Energy, Kralja Milana 36, Beograd

**13.00 – 14.00:** Meeting with the UNDP project team-TBC

Participants: Manfred Stockmayer and UNDP project team

Venue: CCIS, Resavska 13-15, office 410

**15.00 – 16.00:** Meeting with the representatives of Chamber of Commerce and Industry of Serbia

Participants: Manfred Stockmayer, Miroslav Lutovac, Ljubinko Savic, Vera Raznatovic, Vlado Kovacevic and UNDP project team

Venue: CCIS, Resavska 13-15, office 410, Belgrade

Topic: Web portal "Green Energy" along with application for biomass e-trading

**Friday, March 15<sup>th</sup>**

**09.30 - 10.00:** Meeting with Branko Stajic, Dušan Jović, Zoran Knežević and UNDP project team

Participants: Manfred Stockmayer, Branko Stajić, Dušan Jović, Zoran Knežević and UNDP project team

Venue: Chamber of Commerce and Industry of Serbia, Resavska 13-15, office 410

Topic: Energy crops

#### **11.15 – 11.45: Meeting with Vlado Kovacevic**

Participants: Manfred Stockmayer, Vlado Kovacevic and UNDP project team

Venue: Chamber of Commerce and Industry of Serbia, Resavska 13-15, office 410

Topic: Position paper related to the use of agriculture biomass as energy source in Serbia

#### **14.00 – 15.00: Meeting with UNDP representatives**

Participants: Manfred Stockmayer, Steliana Nedera (UNDP Resident Representative a.i.),

Zarko Petrovic, Programme Analyst Resilient Development and Maja Matejic, Portfolio Manager

Venue: UNDP, Bulevar Zorana Djindjica 64, Novi Beograd

## **6.8 List of persons interviewed**

Milos Banjac	Ministry of Mining and Energy
Aleksandar Bogunovic	Chamber of Commerce
Vesna Gajic	UNDP
Branko Glavonjic	Faculty of Forestry, University of Belgrade
Miodrag Gluscevic	Standing Conference of Towns and Municipalities
Dusan Jovic	Ministry of Agriculture, Forestry and Water Management
Zoran Kapor	GFA
Zoran Knežević	Chamber of Commerce
Vlado Kovacevic	Chamber of Commerce
Miroslav Lutovac	Chamber of Commerce
Maja Matejic	UNDP
Milan Miric	Regional Development Agency Srem
Steliana Nedera	UNDP Resident Representative
Mr. John O'Brien	UNDP – Regional Technical Advisor
Zoran Pomoriski	Bioelektra
Ivan Radovic	Forkom
Antonela Solujic	Ministry of Mining and Energy
Branko Stajic	Chamber of Commerce
Dragan Stefanovic	UNDP
Dragan Zukic	Biogas Association

## **6.9 List of documents reviewed**

In alphabetical order

<b>Document</b>
Biomass Budget Monitoring 02.03.2019
Biomass Project Media Outreach 2015-2020
Co-Financing 16 03 2019
Cost Benefit Analysis for one CHP plant supported by the Project
Elaborate presentation of the Project.

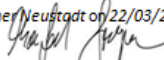
Endorsements on obtaining the status of privileged power producers for 5 projects
GHG Monitoring Report
Inception Report
Integral budget monitoring sheet
Minutes Inception Workshop
Minutes of Meeting of Local Appraisal Committee Meeting
Minutes of Meeting of the Biomass Support Unit (BSU), Meetings 1 – 14
Monitoring and Evaluation Plan for the GEF Project “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”
MTR Report and Management Response
Operation Permits (in Serbian) for 6 projects
PIF and related documents
PIRs for 2015-2018
Project Co-financing Letters
Project Extension Documents
Public Call to Banks
Public Call to Investors
UNDP Prodoc and endorsement documents
Updated Project Logframe after MTR

## 6.10 Signed UNEG Code of Conduct form

### ANNEX E: EVALUATION CONSULTANT CODE OF CONDUCT AND AGREEMENT 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 limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation Consultant Agreement Form <sup>1</sup>	
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 22/03/2019	
Signature:	

## 6.11 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:

## **6.12 Audit trail from received comments on draft TE report**