



TERMINAL EVALUATION REPORT
UNDP–GEF MEDIUM-SIZE PROJECT

**BOSNIA AND HERZEGOVINA - BIOMASS ENERGY FOR
EMPLOYMENT AND ENERGY SECURITY**

UNDP PIMS ID: 3880

GEF Project ID: 3257 :

GEF-4 Strategic Program: Modern Energy from Sustainable Biomass

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LIST OF ACRONYMS

BiH	Bosnia and Herzegovina
CO	Country Office
CO_{2eq}	Carbon Dioxide Equivalent
DIM	Direct Implementation Modality
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
GEF	Global Environmental Facility
ISO	International Standards Organisation
GHG	Greenhouse gases
kt	kilotonne
kW	kilowatt
kWh	kilowatt-hour
Mt	megatonne
M&E	Monitoring and Evaluation
MTE	Mid-term Evaluation
OFP	Operational Focal Point
PIR	Project Implementation Review
PMT	Project Management Team
PAB	Project Advisory Board
PB	Project Board
PRF	Project Results Framework
RE	Renewable Energy
RS	Republic of Srpska
SBAA	Standard Basic Assistance Agreement
SRRP	Srebrenica Regional Recovery Program
ToR	Terms of Reference
UNDP	United Nations Development Programme
USD	United States Dollar
WB	World Bank

EXECUTIVE SUMMARY

As a standard requirement for all UNDP implemented, GEF financed projects, this Terminal Evaluation (TE), has been initiated by UNDP. In accordance with the UNDP partnership protocol with the GEF, all GEF-financed projects must receive a final (terminal) evaluation including, at a minimum, ratings on a project's relevance, effectiveness, efficiency, and monitoring and evaluation implementation, plus the likelihood that results (outputs and outcomes) can be sustained. As a basis for evaluation, the most recent UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects¹ has been used. The Terms of Reference of the evaluation are presented in Annex 1.

The key data of the project subject to this evaluation is presented in the table below

Project title: Bosnia and Herzegovina - Biomass Energy for Employment and Energy Security				
UNDP Atlas Award ID:	00046049	Project Financing:	At endorsement (millions of US\$)	At completion (millions of US\$)
UNDP Project ID:	00054633	GEF	966,850	966,850
UNDP PIMS #:	3880	IA/EA Own ²	1,322,100	1,870,000
GEF Project ID:	3257	Government	-	130,000
Country	Bosnia and Herzegovina	Others	300,000	150,000
Region	RBEC	Total co-financing	1,622,100	2,150,000
GEF Focal Area	Climate Change	Total project costs	2,588,950	3,116,850
GEF Replenishment Period	GEF-4	Prodoc Signature (date project began):		21.09.2009
GEF Strategic Program(s):	GEF-4 Strategic Program 4: Promoting Sustainable Energy Production from Biomass	(Operational) Closing Date:	Proposed	Actual
Implementing Partner	UNDP		31.12.2013	31.12.2014
Other partners involved	Ministry of Foreign Trade and Economic Relations of BiH; Partner Ministries of the RS Entity			

Brief Description of Project

The project objective is defined in slightly different ways in different documents, but as explained in the narrative of the project document, the objective is to avoid 80,000 tonnes of CO_{2eq} over 15 years by retrofitting or installing biomass fired boilers in Bosnia and Herzegovina. By focusing on the Srebrenica region covering the municipalities of Srebrenica, Bratunac and Milici, the project seeks to address barriers in policy and legislation, finance, business and management skills, awareness, and technology through a comprehensive barrier removal strategy that addresses biomass supply including forest management and demand-side biomass technology deployment.

The specific subcomponents (outcomes) of the project include:

- Increasing the market demand for biomass energy;
- Strengthening and expanding the biomass fuel market and supply chain; and
- Convincing the policy makers, financial sector, fuel and technology suppliers and niche markets on benefits and market opportunities for biomass energy.

¹ <http://web.undp.org/evaluation/documents/guidance/GEF/UNDP-GEF-TE-Guide.pdf>

² including the UNDP SRPP Forestry and Employment project

Summary of conclusions, recommendations and lessons learned

While focusing on the Srebrenica region targeting primarily the education sector, the project clearly has played a critical role in boosting the biomass energy market within both political entities of Bosnia and Herzegovina, which growth is likely to continue also after the project closure. The project has contributed in a significant way to increasing the awareness and confidence of a variety of stakeholders on biomass energy as a serious and cost-effective alternative to the use of fossil fuels in heating of schools and other public buildings. Several innovative approaches and good practices have been tested in the schools to start the education of children on energy and environmental issues already at the lowest grades. A summary of the ratings concluded by the evaluation is presented in the table below.

Evaluation Ratings:			
1. Monitoring and Evaluation	Rating	3. IA & EA Execution	Rating
M&E design at entry	Moderately satisfactory (MS)	Quality of UNDP implementation	Highly satisfactory (HS)
M&E Plan Implementation	Moderately satisfactory (MS)	Quality of execution – Executing Agency	N/A
Overall quality of M&E	Moderately satisfactory (MS)	Overall quality of implementation/execution	Highly satisfactory (HS)
2. Assessment of Outcomes	Rating	4. Sustainability	Rating
Relevance	Relevant (R)	Financial resources	Likely (L)
Effectiveness	Satisfactory (S)	Socio-economic	Likely (L)
Efficiency	Satisfactory (S)	Institutional framework and governance	Likely (L)
Overall project outcome rating	Satisfactory (S)	Environmental	Likely (L)
		Overall likelihood of sustainability	Likely (L)

While the project fell somewhat short from achieving some of the initially set targets, in particular as it concerns the number of schools to be converted to the use of biomass by the end of the project and immediately after that, the problem was identified more to be on the overly optimistic initial target setting at the project design, including some misassumptions on the average size of the biomass boilers to be installed, than on inefficient project implementation. Another issue was that as opposite to the planned project strategy to finance the majority of the boiler conversions under a Heat Supply (or Energy Service) Contracting modality by the private sector, it was found out at the outset of project implementation that this is not possible under the current RS Law on Public Procurement, which would need to be amended first. As such, the project had to reverse back to more traditional grant schemes in supporting the planned boiler conversions. Heat supply contracts were successfully initiated, however, in three regions of the Federation of Bosnia and Herzegovina. A summary of the biomass energy projects, the realisation of which the GEF project has either directly or indirectly influenced is presented in chapter 3.3.1, Table 3.3.1 of this report.

The co-operation initiated and continued during the project implementation with the Ministry of Foreign Affairs of the Czech Government has been particularly important to the achieved project results by facilitating the implementation of the first biomass boiler conversions in the Srebrenica region, thereby also partly compensating for the damage created by the lost opportunities to finance the biomass energy projects under the initially planned Heat Supply Contracting modality. Succeeding with this co-operation also provides a good example of the excellent and essential adaptive management that has been practiced for the project throughout its implementation. Similarly, the continuing co-operation with the UNDP regional office in Srebrenica in the frame of the UNDP Srebrenica Regional Recovery Program provides an excellent example of co-ordinating and mainstreaming the GEF funded activities with the UNDP's core activities in the region.

On the negative side, the monitoring of the actual performance of the biomass energy installations facilitated so far has been clearly inadequate, by which the project is not able to present yet a good set of verified and credible data on the achieved energy and cost savings and related greenhouse gas emission reductions. While a report on reduction of greenhouse gas emissions from the pilot projects had been finalized and was available for review during the evaluation mission, this was prepared based more on theoretical values and assumptions than by relying on the actually monitored data. Activities towards correcting the situation was, however, started already during the evaluation mission and it should be possible to complete them at a satisfactory level still before the final closure of the project.

The monitoring of the performance of the installed biomass boilers is planned to be continued also after the project in the frame of the new UNDP Green Economic Development (GED) project and the Energy Management and Information System (EMIS) introduced as a part of that not only to serve the immediate purpose of evaluating the project impact, but to serve the future awareness raising and capacity building efforts based on verified and credible monitoring data on the performance of real functioning biomass energy projects. A recommendation for follow-up activities would be to extend such monitoring activities and data collection also to other biomass projects implemented both in the RS and FBiH, which may have not been directly supported by UNDP and/or the GEF project, but to which information UNDP has or may get access based on the agreement with the project owner(s).

Other observations, recommendations and suggestions of the evaluation include the following:

1) As mentioned before, the project has clearly had a significant impact in increasing the general awareness on and acceptance of biomass energy as a serious and cost-effective alternative to the use of fossil fuels in heating of schools and other public buildings. Several innovative approaches and good practices have also been tested in the schools to start the education of children on energy and environmental issues already at the lowest grades. Based on the discussions and observations during the evaluation mission, however, they may have remained as a “one shot activity” implemented once, but forgotten after that. During the evaluation mission it was not possible to meet any of the teachers that were trained on delivering the classes on energy and environment so as to clarify to what extent the earlier initiatives may have been followed up and/or are still used in their current work. The impression from the discussions with the school directors was, however, that if not formally integrated into the school curricula (based on the request of Ministry of Education), the earlier awareness raising activities may not anymore be replicated for new classes and/or the materials prepared used. As such, some further follow up during the remaining project implementation could be organized both at the level of the Ministry of Education and Culture and at the schools with the teachers trained on how to make the effort more sustainable.

2) As a part of the effort to strengthen the monitoring functions, it was tentatively agreed during the evaluation mission that the project seeks to attach still during the remaining project implementation a heat meter into each installed biomass boiler supported with project funds as well as to agree with the school management on recording the meter readings together with the fuel consumption data at agreed regular intervals and reporting them to UNDP. Furthermore, a strategy and implementation arrangements for measuring and reporting the achieved thermal comfort inside the school buildings during the current heating season should be agreed upon by relying on relatively cheap measurement and data recording instruments. Although the project will formally end in a couple of months' time, the monitoring can be continued as a part of the planned follow-up activities. Correspondingly, the current cost-benefit and GHG reduction analysis can be updated based on the actually monitored data and performance of the pilot projects rather than relying on the initial theoretical design values.

3) The original project design included no legal and regulatory component and no such activities were introduced into the project during its implementation either (apart from translating and facilitating the adoption of 5 EN standards for solid biomass fuel specification and classes). Starting with awareness raising activities is appropriate, but future interventions should gradually start to address also the identified legal and regulatory barriers, One of those barriers is within the current Public Procurement Law of the Republic of Srpska, for which the discussions on the required amendments to better support new contacting modalities and to leverage financing for investments, which the municipalities may not afford to make at once by themselves, could be initiated.

4) Another thing is that the information and conclusions of the project have not really found yet their way to the key policy and strategy documents of the different Government entities such as the Ministry of Education and Culture and the Ministry of Industry, Energy and Mining. The possibilities for further co-operation with the mentioned entities should be explored as a part of the possible follow-up activities of the project. The elements of this eventual follow-up support could include required background studies and updated resource assessments, drafting of action plans (or relevant parts of them), design of possible financial and/or fiscal incentives, standards and regulations for quality control of both the hardware and the design works as well as of the different types of biomass fuels sold at the market etc. Furthermore, for the design of fuel-switching projects, some further training and capacity building may be required for optimizing the design and costs and the desired thermal comfort by an integrated demand side energy efficiency and supply side RE approach. All this subject to an updated situation analysis and needs assessments, however. These are also areas, where opportunities for co-operation with the National Biomass Association may be explored further so as strengthen its existence and eventually broaden its membership base.

5) Despite the initial project idea of relying on wood chips as the primary type of wood fuel to be used for heating of municipal buildings, the production of them has not really taken off yet in a larger scale. In the interviews with different stakeholders, to great extent this was considered to be because of different organisational and institutional barriers, but there are also issues with suitable machinery, available financing options to purchase such machinery by small companies etc., all of which are aspects that eventually could be supported within planned follow-up activities.

6) UNDP BiH in general appears to be in an excellent position to continue the effort of promoting the EE and RE agenda in the country with both political entities by maximizing the synergies with its other ongoing projects. The new Green Economic Development (GED) project, in particular, can be mentioned with partnerships already created with the FBiH Environmental Protection Fund and the RS Environmental Protection and Energy Efficiency Fund for exploring the potential for new financing mechanism. The mutual benefits of co-operation with bilateral donors were already demonstrated during the project implementation and this is worth following up. The planned UNDP follow up project on "Biomass Energy for Employment and Energy Security" would provide an excellent platform to continue to push the bioenergy agenda in particular.

1. INTRODUCTION

1.1 Project background

The initial project idea goes back to 2006, born in the frame of the UNDP led “Srebrenica Regional Recovery Programme (SRRP)”, for which the forestry sector had been identified as one of the key vehicles for recovery and development of the areas that were most severely affected by the Bosnian war in 1992-1995. Forestry and wood processing has historically been a major industry in the Srebrenica region, but after the war has had problems to restore the production, to invest in modern equipment and to demonstrate the sustainability otherwise. To help the recovery, UNDP initiated the SRRP Forestry for Employment Project “Regeneration of the Forestry and Wood-Processing Cluster in the Srebrenica Region” with a focus on three municipalities: Bratunac, Milići and Srebrenica. The GEF funded biomass energy project was developed to complement this initiative with a specific focus on promoting sustainable biomass energy services in the region and with a replication potential in Bosnia and Herzegovina in general.

Bosnia and Herzegovina (BiH) has significant biomass energy resources and the rural population in particular is commonly relying on firewood for meeting their energy needs for heating and cooking. A large potential for further biomass energy use exist, but a number of interrelated market barriers were recognized to restrict its further deployment. These barriers, together with the project objective and outcomes are discussed in further detail in chapter 2.2 of this terminal evaluation report.

Space heating is required in most parts of the country during the winter. Based on the information available at the time of the project preparation, it was estimated that³: “Almost three quarters (73%) of the population use an autonomous heater or boiler to heat their homes, while 22% of households are connected to district heating systems in the main urban centres. The main fuel for household heating is coal or wood, while gas and electricity are uncommon. About 13% use electricity as a secondary heating source, however. In contrast, heating in schools and municipal buildings is dominated by oil and diesel (77%) and electric heating as the main source of heat is significant (21%). This situation is resulting from decisions in municipalities to switch to electric boilers after the war, when electricity prices were heavily subsidized and electric supply agreements offered other social and political benefits. Since then, however, the power prices have been rapidly increasing, which has created an opportunity for biomass to be a least cost heating alternative.”

1.2 Purpose of the evaluation

As a standard requirement for all UNDP implemented, GEF financed projects, this Terminal Evaluation (TE), has been initiated by UNDP. In the “Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF Financed Projects (2012)”, such evaluations are defined to have the following complementary purposes:

- To promote accountability and transparency, and to assess and disclose the extent of project accomplishments;
- To synthesize lessons that can help to improve the selection, design and implementation of future GEF financed UNDP activities;
- To provide feedback on issues that are recurrent across the UNDP portfolio and need attention, and on improvements regarding previously identified issues.

³ Source: UNDP/GEF Project document “Biomass Energy for Employment and Energy Security”

- To contribute to the overall assessment of results in achieving GEF strategic objectives aimed at global environmental benefit; and
- To gauge the extent of project convergence with other UN and UNDP priorities, including harmonization with other UN Development Assistance Framework (UNDAF) and UNDP Country Programme Action Plan (CPAP) outcomes and outputs.

In accordance with the UNDP partnership protocol with the GEF, all GEF-financed projects must receive a final (terminal) evaluation including, at a minimum, ratings on a project's relevance, effectiveness, efficiency, and monitoring and evaluation implementation, plus the likelihood that results (outputs and outcomes) can be sustained.

1.3 Scope and Methodology

The evaluation has been conducted in accordance with the most recent UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects by framing the evaluation effort using the criteria of relevance, effectiveness, efficiency, sustainability and impact. In conducting the evaluation, the UNEG Ethical Guidelines for Evaluation have also been fully respected.

As outlined in the ToR of the assignment, the evaluation shall provide evidence-based information that is credible, reliable and useful by following a participatory and consultative approach ensuring close engagement with the key counterparts. Field visits during the evaluation mission were organized in Sarajevo, Banja Luka, Bratunac and Srebrenica with corresponding meetings with key project stakeholders and beneficiaries. A complete list of the persons interviewed is presented in Annex 3 of this evaluation report.

In addition, other relevant sources of information were reviewed such as the original project document, project inception report and annual project implementation reviews, mid-term evaluation and related management response, annual financial reports as well as technical reports and documents produced in the frame of the project. A complete list of the reviewed documents is presented in Annex 4 of this evaluation report.

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

<p>Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution</p> <p>6: Highly Satisfactory (HS): The project had no shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency</p> <p>5: Satisfactory (S): There were only minor shortcomings</p> <p>4: Moderately Satisfactory (MS): There were moderate shortcomings</p> <p>3: Moderately Unsatisfactory (MU): The project had significant shortcomings</p> <p>2: Unsatisfactory (U): There were major shortcomings in the achievement of project objectives in terms of relevance, effectiveness, or efficiency</p> <p>1: Highly Unsatisfactory (HU): The project had severe shortcomings</p>	<p>Sustainability ratings:</p> <p>4. Likely (L): Negligible risks to sustainability</p> <p>3. Moderately Likely (ML): Moderate risks</p> <p>2. Moderately Unlikely (MU): Significant risks</p> <p>1. Unlikely (U): Severe risks</p>	<p>Relevance ratings:</p> <p>2. Relevant (R)</p> <p>1. Not relevant (NR)</p> <p>Impact Ratings:</p> <p>3. Significant (S)</p> <p>2. Minimal (M)</p> <p>1. Negligible (N)</p>
<p>Additional ratings where relevant: Not Applicable (N/A); Unable to Assess (U/A)</p>		

1.4 Structure of the 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 starting from page 6 is providing a quick overview on the main project results, ratings, other observations and recommendations for further work.

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Project start and its duration

The project was initially submitted as a medium size proposal for GEF approval in March 2007. The final approval for a GEF grant of USD 966,850 was received in October, 2008. The project document was signed in October 2009, followed by the project inception workshop in March, 2010. The inception report was finalized in May 2010. An extension to the initially planned project duration of four years was granted in January 2013 with the current revised closing date as of December 31, 2014

2.2 Problems that the project sought to address

The key problems the project seeks to address have been defined in the project document and in the original MSP proposal as follows: “Despite the large potential for biomass energy, a number of interrelated market barriers combine to restrict the self-sustaining growth of this market. During project preparation, and in consultation with a wide range of stakeholders, the following barriers were identified:

- Availability of finance;
- Business models and management skills; and
- Awareness

Finance barriers

The high capital cost of biomass energy systems is a major barrier to the increased use of these systems despite significantly lower operating costs and rapid investment payback. There are significant other priorities for public and private funds such as after the war’s country reconstruction, food security, poverty, and local financial resources are consequently scarce. This means that investment decisions favour minimizing investment costs at the cost of operating costs. Since there are very few biomass energy projects, there are no economies of scale in all stages of project development and execution, thus making biomass energy more costly.

Business and management skills barriers

There is limited experience in the implementation and operation of biomass energy projects. Limited spatial distribution of suppliers limits access to renewable energy technologies (hardware).

Information, knowledge and awareness barriers

There is very limited availability and access to existing renewable energy resource information. Data frequently does not exist, and a central information point is lacking – information is scattered between sectors; e.g. public sector, private sector (including consultancy firms), development assistance, R&D centres and academia. Where information on economics, market development, marketing, and technical issues does exist, it is distributed between organizations that do not co-operate.

There is a lack of awareness of modern options for biomass energy. Knowledge, for example, on the fact that life cycle costs of the biomass energy technologies are often competitive or even lowest cost options is

mostly absent. There is a perception that the traditional use of wood and charcoal must be reduced, so biomass energy is seen as something to be discouraged.

There is also limited technical capacity to design, install, operate, manage and maintain renewable energy based modern energy services, mainly as a result of lack of past activities in this field.

2.3 Project objective and established indicators

The project objective is defined in slightly different ways in different documents, but starting with the narrative of the project document, the stated project objective is to “avoid 80,000 tonnes CO_{2eq} over 15 years by retrofitting or installing biomass fired boilers in BiH.” This estimate of the project’s indirect impact was based on the assumption that from the total of 2,300 schools in Bosnia and Herzegovina (BiH), the number of schools using biomass as an energy source would gradually increase to 500 by 2020, complemented by further country-wide replication in other municipal buildings such as hospitals and medium sized businesses resulting in cumulative CO₂ reduction of 200,000 tons by 2020, of which the indirect impact of the GEF project would be 80,000 tonnes of CO_{2eq} by using the causality factor of 40%.

In the project objective section of the project document it is also stated that the “GEF MSP will be closely integrated into the UNDP SRRP Forestry for Employment Project “Regeneration of the Forestry and Wood-Processing Cluster in the Srebrenica Region” and that “the proposed project will enhance local experience and awareness of biomass energy providing a firm foundation for these issues to be addressed in the context of larger initiatives to address energy, forest and business policies and legislation.”

In the Project Results Framework (PRF), the project objective is defined to be “sustainable reduction of GHG emissions through a transformation of the biomass energy market in Bosnia and Herzegovina” with an end of the project target: “Schools with retrofitted or new biomass boilers totalling 5,837 tCO_{2e} in direct emissions reductions”. In the updated PRF done during the inception phase, the formulation of the project objective was maintained similar to the original PRF, but the end of project target was slightly reduced to 5,200 tCO_{2e}.

The original MSP proposal defines more precisely in the chapter dealing with the justification and rationality of the project that it is “to remove market barriers to the adoption of sustainable biomass energy services in rural areas of Bosnia and Herzegovina through market transformation, enhancing job creation, community poverty reduction and local energy security. Focusing on the Srebrenica region covering the Municipalities of Srebrenica, Bratunac and Milici, the project addresses barriers in policy and legislation, finance, business and management skills, awareness, and technology through a comprehensive barrier removal strategy that addresses biomass supply including forest management and demand-side biomass technology deployment. The project will cooperate closely with the UNDP-SRRP Forestry for Employment Project to provide a model for addressing sustainable biomass supply. The GEF project uses an innovative niche market buyers-group approach (procurement) to increase sales volume, supported by heat service contracting (Build, Own, Operate, Transfer – BOOT), where technology suppliers carry both investment and operational risk and it represents best practice in building local ownership of project successes, enhancing sustainability and replicability”. The specific subcomponents (outcomes) of the project include:

- Increasing the market demand for biomass energy;
- Strengthening and expanding the biomass fuel market and supply chain; and
- Convincing the policy makers, financial sector, fuel and technology suppliers and niche markets on benefits and market opportunities for biomass energy.

2.4 Main stakeholders

Neither the project document nor the inception report is presenting any comprehensive stakeholder analysis or stakeholder involvement plan. The inception report is, however, referring to initial meetings held in Banja Luka “with relevant government counterparts namely RS Ministry for Education and Culture, Ministry for Agriculture, Forestry and Water management, Ministry of Industry, Mining and Energy and Ministry for Spatial planning, Civil engineering and Ecology. Furthermore, the project inception report states that the Project Board should be composed by the representatives of the following agencies:

- The Ministry of Foreign Trade and Economic Relations represented by GEF Operational Focal Point or his/her designated official.
- Ministry of Agriculture, Forestry and Water – management RS represented by Deputy Minister or his/her designated official,
- Ministry of Education and Culture RS represented by Deputy Minister or his/her designated official,
- Ministry for Industry, Energy and Mining RS represented by Deputy Minister or his/her designated official
- Ministry for Spatial Planning, Civil engineering and Ecology (represented by Deputy Minister or his/her designated official
- UNDP Country Office in BiH represented by the Resident Representative or his/her designated official.

It was also recommended by the inception report that “cooperation should be established with the World Bank (WB), EBRD, USAID, FAO, ECE and similar international partners who are active in similar segments of activities.”

What makes the project implementation somewhat extraordinary and challenging from the institutional point of view is that in accordance with the Dayton Peace Agreement signed in 1995, Bosnia and Herzegovina presently consists of two, largely autonomous political entities, namely the Federation of Bosnia and Herzegovina (FBiH) and the Republic of Srpska (RS), of which the latter is hosting the sites for the realized pilot investments. While the Ministry of Foreign Trade and Economic Relations (MoFTER) is expected to coordinate economy, environment and energy policy development at the state level, the influence of the central government in practice is rather limited: Each entity has its own regulations and administration governing environmental and energy issues. As an example, the Ministry of Energy, Mining and Industry of the Federation of Bosnia and Herzegovina (FBiH) is governing the energy issues in the area of FBiH, while the Ministry of Industry, Energy and Mining of the Republic of Srpska (RS) is doing the same for its respective area. A similar situation exist in forest management, for which, according to the project document, “the approaches of the two political entities are insufficiently integrated and coordinated” resulting in gaps in planning and implementation and lack of coordination between forestry and the wood processing industry.

As private sector stakeholders, the project document is highlighting the potential role of two biomass boiler producers in Bosnia and Herzegovina, namely “NARODNO GRIJANJE” based in Sarajevo and “TOPLING” based in Prnjavor, both of which were assumed to be of adequate size to enter the heat supply service contract market. In this context, NARODNO GRIJANJE was also included as one of the project’s co-financiers with a letter indicating an investment of USD 300,000, “subject to meeting adequate economic and financial prerequisites for participation.” By the time the project started, however, the company had already gone out of the business and this potential co-financing was lost.

Concerning the co-ordination with other projects and donors, the project document is envisaging the GEF project activities to be implemented together and in close co-ordination with the related activities of the

UNDP SRRP Forestry for Employment Project and indirectly with the World Bank Forest Development and Conservation Project through its explicit co-operation strategies with SRRP. Discussions were also held with the EBRD, which at the time of project preparation was exploring a possibility to establish a credit line for water, energy efficiency and renewable energy in the Balkans. The proposed UNDP GEF activities were viewed as highly complementary to any such credit line.

2.5 Expected Results

The expected key results and end of project targets at the project objective level were already discussed in chapter 2.3 and, as such, are not repeated here. As outcome and output specific targets, the Project Results Framework (PRF) is listing the following (with the changes adopted in the project inception workshop highlighted):

Outcome 1: Market demand for biomass energy is increased with updated end of project targets of: i) at least 10 schools with retrofitted or new biomass boilers with total GHG emission reduction of at least 5,200 tCO_{2eq} (and, ideally, greater than 5,837 tCO_{2e}) in direct emissions over their 15 years' default lifetime (*reduced from 20 boilers and 5,837 tCO_{2eq} in the original PRF*) and ii) replication of the promoted business model (heat service contracting) in at least two other regions of BiH.

As complementary results under Outcome 1, it was expected that "clusters of buyers will be established to make standardized procurement requests (following the "technology procurement" approach), improve access to capital, and improve fuel planning and purchasing, and to develop and negotiate a „joint“ heat service contract model (based on BOOT, Build, Own, Operate and Transfer approaches). The intended results of this is that groups of buyers will be able to increase the sales of biomass systems by being large enough to (a) influence boiler product design and build specifications and produce boilers more suitable and cost-effective for typical users (mid-sized boilers for institutional users); (b) make heat service type contracts worthwhile; and (c) stimulate the organization of fuel supply”.

The specific outputs defined for Outcome 1 consisted of:

Output 1.1: Biomass energy systems procured in education sector (pilot niche buyer cluster), key technologies demonstrated in a highly visible way

Output 1.2: Model biomass fuel specifications and heat delivery contracts (service contracts) prepared

Output 1.3: Transaction support provided through technical, social and legislative expertise (by a pool of experts); and

Output 1.4: Business models (heat service contracting) improved and replicated by ensuring that the private sector shares appropriate market risk and doesn't have this covered entirely by grants from donors and that interest rates adequately reflect risk and that this is not simply covered by the donor or banking credit lines in sinking and unsustainable funds.

Outcome 2: Biomass fuel market and supply chain strengthened and expanded with the stated end of project targets in the PRF of: i) 250 tonnes (approx 900 m³) per year of sustainably sourced (certified) biomass fuel wood (chips or logs) supplied to project boilers at a competitive price; ii) perceptions of fuel supply risk reduced by 50% based on „consumer confidence“ survey and iii) competition in fuel supply for the 20 biomass boilers (at the inception phase reduced to 10 in line with the changes for Outcome 1) exists, signified by supply offers covering 150% of needs.

As described in the project document, Outcome 2 shall focus "on business and management skills and market oriented supply chains, revenue structures, delivery infrastructure, and identification of appropriate incentives. Under this outcome the project will tackle barriers to the market for the supply of biomass fuel,

including efficient delivery infrastructures and sustainable forest certification for wood fuel. Ultimately the outcome aims to improve business models and replicate successful approaches to reach a significantly larger market.” The majority of outcome 2 was expected to be financed by the UNDP Forestry and Employment project with the exception of Activity 2.2.11 on fuel certification procedures, which was foreseen to be financed by the GEF. The specific outputs under Outcome 2 were defined as follows:

Output 2.1: Access to investment capital and effectiveness in forest and wood-processing sectors increased, including the creation of a medium-term “Job Creation Tax Incentive Mechanism” through a “cash refund” from UNDP/SRRP to local fiscal authorities; and

Output 2.2: Sustainable supply of legally harvested timber increased, including establishment of discussion forums, knowledge building and training, establishment of procedures and criteria for sustainable forestry and fuel certification in accordance with international best practices as well cost-sharing of local forest road construction and mine clearance.

The project inception report concluded that Outcome 2 was already completed within the SRRP (Srebrenica Regional Recovery Programme) project (closed in 2008) except one sub-activity relevant for fuel certification. There was only \$20,000 of GEF funds budgeted for this outcome over the first two years for fuel certification and thus the project had no more influence (or budget) over the activities which were accomplished”

Outcome 3: Policy makers, financial sector, fuel and technology suppliers and niche markets are convinced of benefits and market opportunities for biomass energy with the end of project target that the “Biomass energy awareness and capacity score” has been tripled in the project area (*reduced at the inception phase from “quadrupled” in the original PRF*)

Targeting the niche market of schools with a comprehensive outreach effort (combining the technical demonstrations in Outcome 1 with the awareness-raising and education), the activities under Outcome 3 were seeking to build on already existing knowledge and materials (local or foreign), and strengthen local private sector and NGO training and advocacy capacities to create awareness, build skills and transfer knowledge, rather than to attempt isolated awareness raising by the PMU itself. Aligning policy development with potential results and value for money, detailed and independent cost-benefit analysis was envisaged to be carried out periodically throughout the project based on the real measured project impacts under Outcome 1.

In the narrative for Outcome 3, it was also stated that: “The strategy aims to facilitate the policy development process through targeted activities and studies built on demonstration and piloting of approaches in the Srebrenica region, supported by awareness raising; and particularly the strategy for the energy sector in BiH sponsored by the WB and national legislation development sponsored by the UN and EU. The impact indicator for awareness raising activities will be based on statistical surveying of intended stakeholder groups at the beginning of the project, at the middle, and at the end. In addition, a comprehensive monitoring and evaluation program will be used to assess lessons learned and inform policy on an ongoing basis.” To facilitate this, it is proposed in the project document that a long-term monitoring and evaluation expert (potentially a small consortium of local and international expertise) will be contracted for the entire project to provide a reliable and consistent monitoring of project impacts under all three outcomes.

The specific outputs under Outcome 3 consist of:

Output 3.1: Baselines are established, and reliable data on local costs and benefits of biomass energy is available for policy development work. From the limited existing experience in Bosnia and Herzegovina, it appeared at the time of project preparation that manufacturers may be willing and able to enter into

performance contracts, and deliver heating system equipment combining solar hot water and biomass energy.

Output 3.2: Advocacy capacities in biomass energy enhanced by creating a local biomass energy association bringing together stakeholders from the forestry, wood-processing, fuel supply, biomass processing equipment, combustion equipment and service industries.

Output 3.3: Project findings used to inform policy development, and build business and finance capacities, establishing conditions for scaling up. Capacity building is suggested to be carried out in the form of a four practical training modules, including competence testing, of one-week each, over a one-year period. The training modules, focused on practical biomass energy project development, will be based on existing material from other countries (e.g. the COGEN3 project from SE Asia, RETScreen, Business Plan guidebooks, Biomass training from Austria, Germany, etc.) and translated to local conditions. During the first year of project implementation training will focus on "Training of Trainers", with a (adapted and improved) course delivered by local trainers in subsequent years.

Output 3.4: Community understanding and acceptance of biomass energy and energy efficiency enhanced through school educational programme. Under this project output, in co-operation with the International SPARE programme, high-quality educational and methodical materials with practical tasks as used in the GEF project in North-western Russia, as well as other high from other countries in which SPARE is operating, will be adapted to the local situation, and made available as a resource to teachers in the project area and through Bosnia and Herzegovina. Teachers training and support will also be included, and a national network of participating schools will be established and enabled to join the activities of the "SPARE" Programme, an educational initiative on energy and environment for children of age 10-15. Schools from the project area will be able to compete in a national and international SPARE „Energy Saving“ competition.

3. FINDINGS

3.1 Project design/formulation

3.1.1 Project design and implementation approach, including the project results framework

As a starting point for project design, the project document is listing several key barriers to increasing the use of biomass energy in the BiH that are common also in many other countries. By and large, those identified barriers are well defined and the project strategy and suggested activities to address those barriers are well thought and grounded to international experiences and good practices, In particular, the importance of awareness raising and concrete demonstration projects demonstrating not only the technical aspects, but also sustainable financing arrangements to promote biomass energy market in the BiH can be considered as a valid approach.

On the other hand, there are a few critical barriers and risks that were not really recognized and/or adequately addressed by the project design and which in the worst case would have effectively jeopardized the success of the project as a whole. The need to amend key project targets immediately at the project inception phase such as the average size and number of the targeted biomass installations as well as later difficulties to proceed with some other key activities such as with the proposed heat supply contracts indicate that more emphasis could have been put on a more careful and comprehensive situation, barrier and risk analysis at the project preparation stage. For instance, the public procurement laws of the Republic of Srpska practically prevent the public entities to tender and enter into multi-year contracts required by Energy Service (or Heat Supply) Contracting, which was considered as one of the backbones in the project design to deal with the identified financing barriers. Most likely, this barrier would

have also prevented the disbursement of the envisaged USD 300,000 co-financing contribution by the private sector under such Heat Supply Contracting modality.

Another thing is that the type and availability of different biomass fuels in adequate amounts to supply the planned pilot projects was not specifically elaborated and assessed at the project design phase. The response to the GEFSec comments at the work program inclusion (Annex B of the project document) is just referring to the annual allowable cut, which in principle would be more than enough to satisfy the fuel demand of the planned pilot projects and their envisaged replication, but which does not mean that the same amount will be readily available in the market as collected and processed biomass fuel in the form of wood chips, briquettes or pellets. The different institutional, regulatory and “entrepreneurial” aspects of ensuring adequate fuel supply for the planned biomass energy installations were not really discussed and addressed by the project design apart from assuming that these aspects will be fully covered by the parallel UNDP SRPP Forestry for Employment Project.

The selected approach to structure the GEF project as a complementary activity to the already ongoing UNDP SRPP Forestry for Employment Project “Regeneration of the Forestry and Wood-Processing Cluster in the Srebrenica Region” in general can be considered as an excellent choice and critical to the project success. The problem is, however, that practically all project outputs and activities contributing to outcome 2 in the project design consist of activities implemented by and funded by this parallel project, which was effectively finalized already in 2008 i.e. well before the implementation of the GEF project even started. This led to a conclusion at the project inception phase that all the activities under outcome 2 have been completed by the other UNDP project and no further resources are going to be spent under the GEF project either to serve the Outcome 2 apart from the mere USD 20,000 reserved for certification activities. The Inception Report, however, includes no assessment to what extent the stated targets of Outcome 2, as listed in the Project Results Framework and in chapter 2.5 of this evaluation report, were effectively reached by the project start. The interviews conducted during this terminal evaluation clearly indicated some severe shortcomings in reaching the initially envisaged longer term impacts of Outcome 2 still exist, although the stated immediate targets may have been met. This is elaborated in further detail below.

The main target of the UNDP SRPP Forestry for Employment project was to develop the forestry and wood processing cluster in the Srebrenica region with a goal “to improve the productivity and viability of forestry and wood processing companies and organizations, providing both sustainable employment opportunities for returnees and environmental benefits.” The project objective was designed to contribute to the UNDP Country Programme Outcome “Sustainable reintegration and recovery of war-affected population”, but none of its listed outputs was specifically addressing the local biomass fuel production. This is also reflected in the formulation of outputs 2.1 and 2.2 and the activities under them, which can be expected to somehow contribute to reaching the stated targets of Outcome 2 of the GEF project, but which clearly would have been inadequate to ensure that on their own. While the wood chips at the project design stage were foreseen to be the primary type of biomass fuel to serve the planned pilot projects and their replication, up until now their production and supply has remained constrained.

Fortunately due to the recognized export opportunities, the production of wood briquettes and pellets from the residues of the wood processing industry (primarily saw dust) took off in parallel, which in the Srebrenica region was also supported by the UNDP SRPP project. The fuel demand of the pilot projects implemented in the frame of the GEF project alone, however, would have most likely not been adequate to establish such production. As such and without the recognized export potential to provide the required basis for the establishment of new briquette and pellet production facilities, which now have mushroomed all across the wood processing industry in the BiH, the situation in ensuring adequate fuel supply to new biomass energy boilers would have been much more critical. Typically, such fuel supply risks are among the most critical risks to be taken into account and addressed in the design of any biomass energy projects, but this is not really reflected in the project design.

The reasons for selecting the educational sector as a spearhead for promoting the use of biomass as an energy source in the municipal sector were listed in the project document as follows:

- Schools are financed by municipalities and can easily be aggregated into purchasing groups;
- Most schools have old and outdated boiler systems in need of repair or renewal;
- The schools sector was considered as politically important to the government as a means to attract emigrants back to BiH; and
- Most school boilers are medium-sized oil- or diesel-fired units, to which biomass is a competitive alternative.

Whether the situation in this respect would have been different in other public buildings is not discussed in further detail in the project document, but in general the interviews conducted during the project evaluation mission confirmed that targeting first the education sector was a good choice.

As it concerns the design of the Project Results Framework, there are some inconsistencies between the narrative of the project document and the PRF. While the project objective in the narrative of the project document refers to the project's replication potential and its indirect cumulative impact of 80,000 tons of CO_{2eq} over the next 15 years, the PRF does not present any meaningful indicator and end of project target to evaluate to what extent such replication may have started to take place by the end of the project. Instead, the PRF is using for the project objective the direct project target of reducing CO_{2eq} emission by 5,837 tons from the installations facilitated by direct GEF financial support. After that, the same target is repeated as an end of the project target for outcome 1. The indicators and the end of project targets for outcomes 2 and 3 are basically OK, but as discussed already before, the outputs and activities under Outcome 2 do not really seem to lead to those targets. As such, the expectations of the PRF to present a logical chain of outputs leading to certain outcomes, which then contribute further to the project objective are not fully met. The outputs formulated under Outcome 1 and Outcome 3 are more on these target than for Outcome 2.

Another thing is that the initial projections of the project to be able to equip at least 20 schools with retrofitted or new biomass boilers with an average size of about 60 kW each did not reflect the situation on the ground, where the required boiler capacity for the main schools in the Srebrenica region is in the range of 400 – 600 kW each. As such, the targeted number of schools was reduced already during the project inception phase from 20 to 10 to better match the realistic funding possibilities. What may matter more in the end, however, is the total installed capacity, the total savings in conventional fuel and the total amount of GHG reduced. In that respect using such indicators instead of the number of schools could have been more appropriate, thereby also avoiding the need to change these indicators immediately at the project start. The size of the boilers installed during project implementation has ranged from 150 to 550 kWp, so even if not meeting the initial target of equipping 20 schools with biomass boilers of 60 kW each, for the total installed capacity the target has already been well passed.

In retrospect, the project objective target (although not reflected in the PRF) of 80,000 tons of CO_{2eq} as an indirect cumulative GHG reduction target from biomass energy boilers installed by 2020 with a GEF causality factor of 40% (meaning the actual CO_{2eq} reduction of 200,000 tons and corresponding to the installed capacity of close to 100 MW) appears to have been a too challenging target. Only by claiming some influence of the UNDP/GEF project on all the currently planned and/or constructed biomass energy projects in the BiH (including new biomass based municipal district heating and cogeneration projects), the stated capacity target could be somehow realistic, but definitely not for over 500 stand alone school installations in just a few years' time.

With the exception of the oversights and defaults discussed above, the project scope, design and implementation approach otherwise, including the Project Results Framework can be considered as

satisfactory for a medium size project addressing the critical elements of awareness raising and facilitating the implementation of concrete pilot projects to build confidence among the key decision makers on biomass energy as technically, cost effective and environmentally friendly alternative to fossil fuels and to support the learning process otherwise to provide the essential basis for replication.

3.1.2 Assumptions and risks

The projects risk and the mitigation strategies to address those risks were summarized in the project document as follows (Risks 1-5), which table was reviewed and updated at the project inception phase with three complementary risks (Risks 6-9) and related risk mitigation strategies addressing fuel supply risk and in the inception workshop observed potential resistance of the school directors.

Table 3.1.1 Project risks and risks mitigation strategies as elaborated in the project document and updated in the project inception report.

Risks	Level	Risk management measures
1. Lack of ongoing, long term political and government support for improved biomass energy sector	Medium	Government commitments in this area have been confirmed on the highest level and they have been committed over some time to biomass energy although financial resources have been limited. Ongoing consultations and ownership of project development and implementation, with key government stakeholders will take place throughout the project.
2. Poor cooperation between government stakeholders	Medium	Highly participatory project development and implementation strategy, with specific incentives to key institutions
3. Inadequate project implementation	Medium	Careful selection of project team members and the M&E to be put in place is required. The project design aims to minimize institutional bureaucracy through careful apportionment of activities between government and private sector.
4. Use of inappropriate technologies	Low	Using technologies with a satisfactory track record and use of experienced contractors will be required. The project focuses on market forces and no technology subsidies from GEF funds increases the chances of rational value oriented investment decisions.
5. The private sector will participate in the project	Medium	Private sector partners were consulted during project and the project has letters of interest from these partners. Furthermore the project has been designed to put USD 300,000 in GEF funds to generate interest and from the private sector through procurement of their equipment.
6. Unreliable demand-supply relations and potential lack of biomass supply in the region	Medium	The current supply and demand situation in the project area will be carefully assessed through a corresponding study. If there is no adequate supply and demand correspondence the alternatives will be looked into. Variations related to supply exist but are manageable if such variations are recognized in procurement strategies and managed by purchasing from adjacent regions.
7. Resilience of schools / school directors	Medium	Government commitments in this area will be required by the Ministry of Education in RS. Once trainings and awareness raising campaigns are completed (based on the cost/benefit and supply/demand studies) it is expected that this risk will become irrelevant.
8. Ensuring long-term and consistent supply of biomass to the installed boiler systems (schools)	Medium	Long term supply of biomass will be potentially established by looking into different alternatives of reaching this goal. The most appealing alternative will be the one where the boiler producers and biomass suppliers are connected into one system (the contracts for supplying the boilers obliges delivery of biomass fuel). End-users must be within a reasonable distance of the biomass source. The distance should be justifiable on economic, practical and environmental grounds. Memorandums of Understanding will be signed with relevant Ministries and private companies,

In addition to the above, the Project Results Framework is listing a number of assumptions for successfully reaching:

The project objective:

- Political and ethnic stability in Bosnia and Herzegovina continue to develop in a positive manner.
- Financial regulations in Bosnia and Herzegovina stay conducive to business expansion in both entities
- Positive macroeconomic indicators; inflation rate stays below 10%.
- Local governments recognize the project as an opportunity for themselves and for their communities

- Scale-up of appropriate business models to other regions in Bosnia and Herzegovina is viable and introduces additional competition into the market.

Outcome 1:

- Procurement processes successfully enable cost reduction & municipalities actively participate

Outcome 2:

- Stakeholders in the wood processing sector in the project area participate in SRRP project activities
- Ongoing support from government and concerned stakeholders

Outcome 3:

- Ongoing support from government and concerned stakeholders
- Government support for action on biomass energy, job creation and energy security continues
- Regulations developed by stakeholders are adopted by government

While many assumptions listed above are largely out of the scope of the project of trying to influence, the list includes several assumptions, however, which beside the PRF should have been addressed in the project's risk analysis and risk mitigation strategies such as the need to have enabling procurement processes mentioned in the context of outcome 1. In the general, the link between the Risks/Assumption section of the PRF and the tables dealing with the risks and risks mitigation strategies in the project document and inception report is not really clear.

The fuel supply risks and possible resistance by the final beneficiaries are critical and should be assessed already at the project development stage by adequate stakeholder consultations. The same applies for the barrier identified afterwards with the RS rules for public procurement, which practically prevents the schools and other public entries to enter into multi-year fuel and/or heat supply contracts.

In the narrative for Output 1.1, it is mentioned that "there is a perceptual barrier in the minds of many potential purchasers of biomass energy as somehow „informal" or less technologically advanced than natural gas....and that there is a certain degree of skepticism of the potential for biomass energy and increased risk aversion on the part of purchasers and financiers." Secondly it is mentioned that "it can be difficult to minimise risk in fuel purchasing without having a "critical mass" of buyers." The proposed demonstration projects are suggested as a way to address both of these barriers. While this may be true for the perception barriers, the still relatively small number and size of the first biomass installations may not really be enough to create a sufficient demand for establishing entirely new production facilities and/or for the purchase of new machinery to start the production of wood chips. Neither one of the above mentioned risks is really reflected in the original project risk matrix either.

3.1.3 Lessons from other relevant projects incorporated into project design

The project document does not include a specific chapter to highlight the lessons from other projects that have been incorporated into project design, but in the section dealing with cost-efficiency it is stated that "the project builds on lessons learnt by UNDP through other biomass projects in the region, aiming to maximize private sector involvement in a competitive environment to enhance cost effectiveness. Key challenges and lessons learnt coming out of this substantial portfolio of projects were reported to include the following:

- Dealing with complexity – it is extremely challenging to work with many and diverse stakeholders and this is a major obstacle for most bio-energy projects. The Bosnia and Herzegovina project focuses on a relatively small project area where allow for these interactions to be arranged on a manageable area, before being replicated in other areas;

- Identifying commercially viable options – while there are many options, commercial viability is generally very locally specific, and depends on many factors. In this project the initial focus will be on the education sector, where lessons can be learnt before replication;
- Selecting and motivating appropriate options – there is a tendency to make early demonstration / market creation activities atypical; special circumstances, extra fancy / expensive equipment, doing everything in one project (e.g. new district heating network + energy efficiency + new boilers + pelletizing + innovative financing, etc. all in one project). In the Bosnia and Herzegovina project, since local stakeholders will cover in part or in total the investment costs, the risk of inappropriate selection of equipment based on large concessional funding will be avoided;
- Competitive approaches in investment project design – ensuring projects remain competitive – avoiding demonstration-phase monopolies. The Bosnia and Herzegovina project, by ensuring that business logic is not removed from the investment decisions (frequently resulting from grants or soft loans for investments) the competitiveness approach will be maximized;
- To enhance cost-effectiveness the project seeks to work initially in a limited area in which UNDP already has ongoing activities, thus minimizing start-up and operating costs. Ensuring close co-operation with these ongoing and future activities will maximize the potential impact of the GEF project. The GEF project uses an innovative niche market buyers-group approach (procurement) to increase sales volume, supported by heat service contracting, where technology suppliers carry both investment and operational risk and it represents best practice in building local ownership of project successes, enhancing sustainability and replicability.

In the narrative presenting the project strategy, complementary reference is made to the following:

- The World Bank in their 2004 'Infrastructure and Energy Strategy' highlighted the current institutional challenges in Bosnia and Herzegovina due to the two different political entities and related lack of co-ordination at the national level, for instance, in the energy and forestry sectors. In the project design, however, the issue is not addressed further in terms of how to support the targeted replications across the entire country, while the project activities are primarily focused on the area of the Republic of Srpska.
- As a backbone of the project to overcome the identified financing barriers and to ensure the sustainability of the effort, the project design is proposing the use heat service contracting in the form of BOOT. Apparently, this is based on successful testing of this model somewhere else, but no reference in the project document is made on the previous experiences and lessons learnt from applying the BOOT model for similar investments.
- To support technology development, the project design is proposing the model of "Technology Procurement", which is a process whereby a group of consumers forms a buyers group that seeks to influence manufacturers to develop and produce products that meet the group's requirements. A reference on the positive experiences from such an approach is made to European Union and, in particular, Sweden and to a number of other unspecified countries,
- For Output 1.3 (Transaction support provided through technical, social and legislative expertise), the project design is suggesting the use of an expert pool, which according to the project document "have proven to be hugely effective in some UNDP-GEF projects (eg. Biodiversity in Latvia), while in other countries the expert pool has found that very little use is made of their skills."
- For the project's educational awareness raising and training activities in general, a reference is made to UNDP experience "to have the potential for long-term sustainability is through educational programmes in schools. This can be achieved at a relatively low cost by building on existing international best practice." It is also mentioned that the "Experience from the international SPARE program has

shown that it is most effective to start the education programme in local elective school programmes and use elements in different existing subjects. Based on practical experience from a few schools, the interest from national bodies can be built, and impacts made on curricular and official programmes”

The lessons from other projects highlighted in the project design are useful, but as discussed before, it appears that the applicability of at least some of them in Bosnia and Herzegovina (or in the targeted pilot area) such as the proposed Heat Supply Contracting and Technology Procurement were not really assessed to the full extent before incorporating them into the project design. A further review and more detailed discussion on lessons from and possible synergies with other projects focusing particularly on biomass energy in the region (supported either by the GEF or other donors) would have also been useful.

3.1.4 Planned stakeholder participation

In Annex L of the project document, it is stated that “numerous stakeholders have been involved in project development through individual meetings as well as in multi-stakeholder planning meetings. Detailed discussions with local stakeholders from civil society, research, private sector, government, and the donor community, were held, and all stakeholders were encouraged to make inputs to project development. These people will be directly and indirectly involved in project implementation.”

The paragraph above is followed by a comprehensive list of stakeholders consulted during project preparation, including other international donors and financing entities (USAID, Spanish Embassy, EBRD), the BiH Ministry of Foreign Trade and Economic Relations of BiH, line ministries dealing with forestry and environmental issues both from the FBiH and RS, Chambers of Commerce, FBiH Regional Development Agency for Central Bosnia and Herzegovina, University of Sarajevo and four companies (two boiler manufacturers, one hotel and the RS Public Forest Company). No further stakeholder analysis or stakeholder involvement plan is presented in the project document, however, apart from the recognized need to implement the project together with relevant activities under the UNDP SRRP Forestry for Employment Project and indirectly with the World Bank Forest Development and Conservation Project through its explicit co-operation strategies with SRRP.

A more comprehensive effort to engage the key stakeholders was made by the inception workshop with over 40 participants, including representatives from different ministries, education sector, NGOs, and private sector companies (with a full list attached to the inception report).

The Inception Report and the minutes of inception meeting also highlighted some key observations and events that had taken place after the project design with an envisaged impact on the stakeholder participation such as;

- Anticipated fatigue, reduced interest and enthusiasm of main institutional partners of the project due to the prolonged duration of project start up and excessive regular workload caused by the EU accession process, which has induced intensive adjustments towards introduction of advanced environmental legislation and standards and involvement in a number of different national and international projects;
- Close-down of the company Narodno Grijanje, the planned project co-financier, while on the other hand several new companies have emerged (in addition to just two boiler manufacturers identified during the project preparation), who contacted the project team during the inception workshop and expressed interest in the project and future cooperation; and
- As opposite to the those private sector representatives (presumably consisting primarily of boiler manufacturers) “who provided their full support to the project by presenting the positive examples from the other regions in BiH and EU thus emphasizing the importance of phasing out the fossil fuels from the public and private sector in sustainable and ecologically safe development”, less enthusiasm was

observed among the elementary school directors and small forestry enterprises, “who expressed reluctance and skepticism in sustainable marked supply as well as the cost/benefit ratio of the installing and retrofitting the biomass boilers.”

As further reported in the Inception Report, “sets of initial meetings with relevant government counterparts (namely RS Ministry for Education and Culture, Ministry for Agriculture, Forestry and Water management, Ministry of Industry, Energy and Mining and Ministry for Spatial planning, Civil engineering and Ecology) were organized in Banja Luka. The respective ministry representatives expressed their positive attitude and support for the project”

The project team was also recommended “to take advantage of lessons learned from other relevant projects in Bosnia and Herzegovina and other countries and regions. Cooperation should be established with the World Bank (WB), EBRD, USAID, FAO, ECE and similar international partners who are active in similar segments of activities.”

By building on the consultations during the inception phase, the suggested composition of the Project Board was presented in the inception report, but was later divided into the Project Board consisting of the Ministry of Foreign Trade and Economic Relations and UNDP only and the Project Advisory Board consisting of the listed RS ministries.

Although the project document does not really include any real stakeholder analysis or stakeholder involvement plan, the project design includes several activities, which by their effective implementation should ensure adequate engagement of different key stakeholder. Such activities are included, among others, under Output 1.1: “Biomass energy systems procured in education sector (pilot niche buyer cluster), key technologies demonstrated in a highly visible way” with a focus on establishment of purchaser groups etc., Output 2.1: “Access to investment capital and effectiveness in forest and wood-processing sectors increased” with a strong focus of partnership building with different key actors, Output 3.2: “Advocacy capacities in biomass energy enhanced”, including the envisaged establishment of a Biomass Energy Association and Output 3.4: “Community understanding and acceptance of biomass energy and energy efficiency”.

3.1.5 Sustainability

The project document includes no separate chapter discussing the sustainability aspects. In section C of the original MSP proposal (“Description of the Consistency of the Project with GEF Strategies and Strategic Programs”), it is stated, however, that:

“The sustainability of the project stems from the market creation approach used in this project, including the following logic:

- Initial calculations indicate that biomass can be least cost, particularly in rural locations in BiH;
- The project will raise awareness to convince buyers, suppliers and policy-makers of the benefits of biomass in BiH;
- The project will support buyers in procurement of competitive biomass systems that meet local needs but cost less than alternatives;
- Finally, the project will draw upon these real experiences to demonstrate the benefits of biomass to policy-makers and to develop a policy environment that will favour further use of biomass throughout the country.

Furthermore, in the section dealing with cost-efficiency, it stated that “The GEF project uses an innovative niche market buyers-group approach (procurement) to increase sales volume, supported by heat service

contracting (Build, Own, Operate, Transfer – BOOT), where technology suppliers carry both investment and operational risk and it represents best practice in building local ownership of project successes, enhancing sustainability and replicability.

In essence, the sustainability of the project is sought to be ensured by the project design, that seeks to combine demonstration of less costly renewable energy alternatives to targeted key stakeholders by selected pilot projects, which do not only demonstrate the technical performance of those projects, but also such procurement arrangements and financing mechanisms involving private sector funding that can be replicated without complementary donor funding for new projects. This is complemented by related awareness raising and capacity building activities.

Although not materializing to the full extent during project implementation, partly due to reasons out of project control, partly for reasons, which eventually could have been identified by more comprehensive situation analysis, the approach of the initial project design to ensure the sustainability of the effort can be considered as satisfactory.

3.1.6 Replication approach

No specific sections in the project document refer to the replication approach, but in essence the longer sustainability of the project results stems from replicating the demonstrated business and procurement models, project design approaches and biomass energy investments in other public buildings and other regions in Bosnia and Herzegovina. Thus a reference is made to the previous chapter addressing the sustainability aspects.

In terms of sharing the results and providing a basis for replicating the project activities in other countries (if successful), no specific outputs or activities have been included into the project design to consolidate all the information, experiences and lesson learnt and for determining the channels, by which these could be brought to broader audience, including also other countries in the region. The outputs 3.4.4 “Organise local exhibitions, roundtables and school competition to present school activities for a wider audience” and output 3.4.5 “Co-ordinate meetings with international SPARE programme” are targeted more for the local audience. Given the importance of the effort for all UNDP/GEF projects to benefit from similar activities implemented in the other countries, to facilitate cross-border information exchange and to learn from the experiences of the project already concluded (not least from the cost-efficiency point of view and by considering the effective use of GEF resources globally), not considering such elements in the project design can be considered as an oversight.

3.1.7 UNDP Comparative Advantage

The agreed comparative advantage of UNDP for the GEF lies “in its global network of country offices, its experience in integrated policy development, human resources development, institutional strengthening, and non-governmental and community participation. UNDP assists countries in promoting, designing and implementing activities consistent with both the GEF mandate and national sustainable development plans. UNDP also has extensive inter-country programming experience.” Furthermore, it has been agreed that UNDP can “play a primary role in ensuring the development and management of capacity building programs and technical assistance projects.”

The project design is fully in line with UNDP comparative advantages as summarized below and presented in the GEF comparative advantage matrix. The project is focused on local capacity building and transferring energy efficiency know-how and tools to local level decision-makers and professionals. Based on the partnership building and experienced gained in the implementation of the UNDP SRRP Forestry for

Employment Project, UNDP was and is also in an excellent position to continue this work by supporting the increasing biomass energy use.

3.1.8 Linkages between project and other interventions within the sector

As reflected already in the previous chapters, the GEF project was built on and was planned to be implemented together with relevant activities under the UNDP SRRP Forestry for Employment Project and indirectly with the World Bank Forest Development and Conservation Project through its explicit co-operation strategies with SRRP, as it concerns any co-operation with forest sector related activities. Discussions were also held with the EBRD, which was exploring establishing a credit line for water, energy efficiency and renewables in the Balkans, to which the proposed UNDP GEF activities were foreseen to be highly complementary.

The training modules to be developed as a part of the project were foreseen to be based on existing material from other countries (e.g. the COGEN3 project from SE Asia, RETScreen, Business Plan guidebooks, Biomass training from Austria, Germany, etc.) and translated to local conditions. Co-operation in that respect with the International SPARE programme and the GEF funded “Cost Effective Energy Efficiency Measures in North-Western Russia” project was also foreseen. Schools from the project area were also envisaged to be able to participate in a national and international SPARE „Energy Saving” competition.

3.1.9 Management arrangements

The project was designed to be implemented by the UNDP BiH office, in line with its special mandate for direct project implementation, thereby using the same approach as for the Srebrenica Regional Recovery Programme. In direct implementation modality (DIM), the UNDP BiH office holds the overall responsibility for the production of outputs/implementation of activities envisaged. The management of project funds is carried out according to UNDP financial rules and regulations, based on a work plan with a detailed budget. An updated project management scheme was presented in the project inception report, as follows:

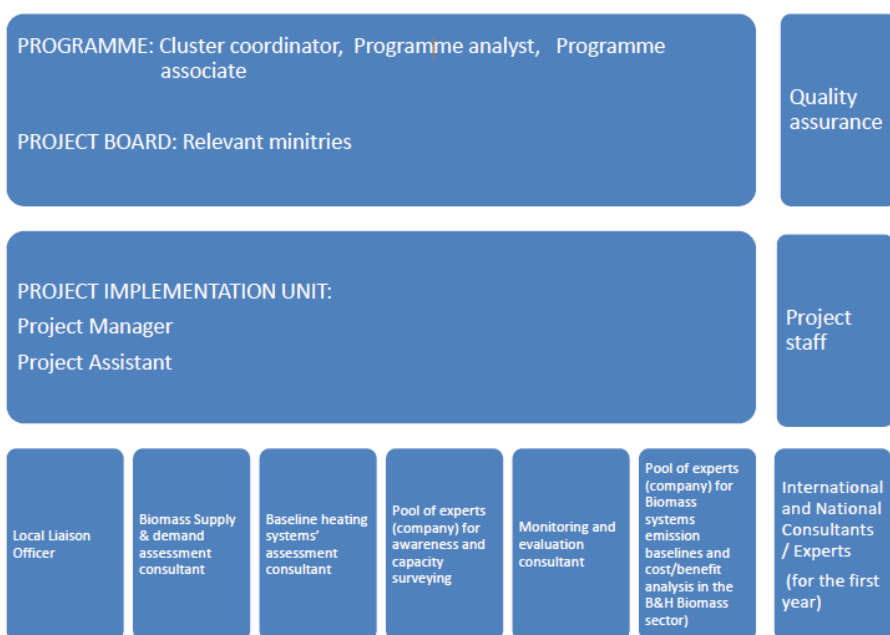


Figure 3.1.1 Project management arrangements, as outlined in the inception report.

The mandate of the Project Board (PB) was defined as to:

- Provide strategic guidance to the project;
- Support project implementation, including bottlenecks resolution;
- Monitor project implementation, discuss and assess project results.

After the finalisation of the inception report, a further decision was made to divide the Project Board to separate Project Board and Project Advisory Board, as presented in further detail in chapter 3.2.6.

3.2 Project implementation

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

Given the misaligned targets of the original project design that were defined on the basis of underestimated average boiler size and overestimated number of boiler conversions to be supported with project funds, some adaptive management actions to downgrade the target from 20 schools to 10 had to be made already at the project inception phase. At the same time, the direct GHG reduction target was reduced from the earlier 5,837 to 5,200 tons of CO₂eq i.e. by about 11%. While the change of the first target concerning the number of schools was well justified and had to be done for the reasons mentioned before, it is less so for the change of the project's direct GHG reduction target. In principle, the main targets, on the basis of which the project has been approved, should not be amended without a good reason to do so and reaching the original direct GHG reduction target even with the reduced number of boiler conversions could have been still viewed as fully realistic by considering the larger average boiler size than envisaged in the original project design.

The financial constraints emerged at the project inception, when the initially envisaged main private sector partner to co-finance the planned biomass investments by heat supply contracting modality had gone out of the business already before the project start. Implementing such contracting modality would have been difficult also otherwise by having the current RS public procurement laws in place. To resolve the situation, the project succeeded in attracting a complementary co-financing contribution of USD 150,000 from the Czech Government, which proved to be critical for achieving the envisaged project outcomes to the extent that they were achieved.

A third critical adaptive management action during project implementation was to change the initially envisaged type of biomass fuel from wood chips to wood briquettes after unsuccessful tenders to procure wood chips. Although deviating from the goal of the original project design to also create new employment opportunities by the production of wood chips, the decision to change from wood chips to briquettes to support the first pilot projects can be considered as the right one given the circumstances faced. This conclusion was further supported by the technical experts interviewed during the project evaluation mission indicating that typically for the size of boilers supported by the project in the range of 100 kW – 1 MW, the economic feasibility between wood chip and other type of biomass boilers needs to be assessed on a case by case basis i.e. the wood chip boiler does not necessarily represent the least cost option for all cases. The original reasons for improving the utilisation of residues currently left to the forests have not disappeared anywhere, however, and thus the opportunities for increasing the wood chip production and use should be further explored during the eventual follow-up activities of the project.

The project also succeeded in leveraging additional financing of \$100,000 from the UNDP SRRP project, thereby allowing the project to also address the schools' energy efficiency improvement needs in Srebrenica and thereby maximise the beneficial impact of biomass boiler installations. The coordination of

energy efficiency and renewable energy aspects was not anticipated in the project document, but has proved invaluable in strengthening development outcomes.

As concluded already by the project's mid-term evaluation: "Additionally, adaptive management has been promoted through careful budget revisions, monitored by RTA, CO programme team and both Project Advisory and Project Boards." The final evaluation supports this assessment.

According to the most recent PIR of 2014, "the main obstacle during the last reporting period was the financial framework for the activities to be conducted. As per project budget, the dollar exchange and project targets (ten fuel switch projects), it was impossible to implement the infrastructure part of the project to the fullest, due to the budget constraints (lack of funds) and need of implementation of other project components. Adaptive management activities have been directed towards major activities of co-financing allocation and advocacy activities with the government institutions (Funds for environmental protection) and municipality authorities. The project has, instead of implementation of lower number of projects, succeeded in securing co-financing from different local authorities, therefore also securing the sustainability component of the project. Additionally, the project has searched for different sources of co-financing or full financing, therefore replicating the project in different areas of Bosnia and Herzegovina thus contributing largely to the creation of biomass market and the awareness of the local authorities in different regions. This has also contributed to the overall emission reduction component. As always during project implementation, minor adaptive management strategies and techniques have been applied throughout planning, procurement and implementation activities, mainly in relation to funds redistribution, technical matters related to project designs and construction works (in order to optimize the impacts and results on the field)." The final evaluation supports these views.

In summary, the project's adaptive management actions can be rated as highly satisfactory adjusting the implementation to changing circumstances and some initial flaws in the project design. This also further backs up the observations from many earlier projects that to the great extent apart from the quality of project design (although obviously contributing to the project results as well), the success of the projects ultimately depends on the motivation and adaptive management capacity of the project management to effectively adjust the project activities to overcome the key barriers and other obstacles the projects are typically facing during the implementation, while still keeping the main project targets and objective in mind.

3.2.2 Partnership arrangements

Beside the consultations conducted at the project development phase, as summarized in chapter 2.4, a critical activity to initiate the required partnership building was the project inception workshop, which according to the inception report "focused on explaining the project objectives, strategy and the work plan and discussing opportunities for partnership during project implementation." Based on the list of participants attached to the inception report, the participants included a broad range of different key stakeholders groups, including representatives of different Governmental entities (primarily from RS), school directors, NGOs and the private sector.

The engagement of the key ministries of the project area has primarily taken place through regular Project Advisory Board (PAB) meetings. This is discussed in further detail in chapter 3.4 "Country Ownership".

The project, in cooperation with the BiH Institute for Standardization, also initiated activities to translate EU standard for Solid Biofuels EN 14961, as guidance for the supply of good quality biomass fuel for project beneficiaries.

The Project Advisory Board did not include any non-governmental entities, but according to the PIR of 2012, several NGOs were included in the implementation of different outputs of the project with a focus on

educational activities and awareness raising and thereby also building the capacities of these NGOs to replicate similar activities in the future, The project has also played a critical role in supporting the establishment of the Biomass Energy Association thereby fostering the important partnership building with and between the private sector companies involved in biomass energy related business. As concluded by project's mid-term evaluation: "The achievement is even more outstanding in that it has brought together a wide spectrum of stakeholders in a country where such partnerships have had little precedence."

As described in the PIR 2014, "local private companies have been connected with the project through the Biomass Association and through project activities related to contracting of assignments. The innovative aspect of these kind of partnerships is the fact that companies have received first-hand on the ground experience with, e.g., installation of biomass boilers and training for their operation."

As mentioned already before, the partnership and the grant co-financing agreement with the Ministry of Foreign Affairs of the Czech Government was absolutely critical in terms of providing an alternative source of financing for the planned biomass installations after the initially envisaged financing modality based on Heat Supply Contracts with local private sector companies failed. The co-operation also included support for knowledge transfer from Czech experts resulting in two reports, one on elaboration of possible business models for heat service contracting and a second one for the design and development of a GHG emission reduction monitoring, reporting and verification system. In addition, a Conference on Biomass was supported with the goal to promote the use of biomass in B&H and to bring together stakeholders from different professional areas (wood processing, forestry sector, mechanical engineering sector, decision makers, public forest companies and potential investors). According to the PIR of 2014, the partnership with the Czech Government has yielded excellent results in terms of establishing a B&H network of interested parties on the topic of biomass coordination (academia, forestry engineers, mechanical engineers, government and private sector). Additionally, the partnership has yielded a recommendation for a new project proposal within the Czech Aid for Trade programme, which is conceptualized around biomass policy and will be implemented by the forestry faculties in B&H (in cooperation with relevant Ministries).

In the Inception Report, it was recommended that co-operation should be established with the World Bank (WB), EBRD, USAID, FAO, ECE and similar international partners, who are active in similar segments of activities. According to the project management, regular „coordination meetings“ of the UNDP E&E sector have been held with the mentioned institutions and their environment sector focal points with an opportunity to exchange information on current activities and future plans of these organizations. No concrete co-operation with the listed entities in the area of financing biomass installations have been established yet, however. It should be noted, however, that the project has been able to raise the general awareness on the opportunities of biomass energy in the BiH, which may show up in future programming of the mentioned institutions, The project has also initiated co-operation with the FBiH Ecological Fund, for possible future and to some extent already materialized financing of biomass energy installations in the area of FBiH.

3.2.3 Feedback from M&E activities used for adaptive management

The key recommendations of the project's mid-term evaluation conducted in March 2013 included the following:

Recommendation 1: Ensure that the 2012 biomass boiler installations in Srebrenica are operational with sufficient and sustainable supplies of biomass.

Given the non-successful tenders and the observed risks of continuing to rely on wood chips as the primary type of biomass fuel for the planned pilot projects, adaptive management actions were taken to

switch to wood briquettes, for which companies already producing these existed in the pilot project area. After one full heating season behind and the second one to start, no concerns were expressed by the key stakeholders that sufficient and sustainable supply of wood briquettes for the realized biomass boiler installations would be at risk. In this respect, it can be concluded that the MTE recommendation # 1 was successfully reflected in project's adaptive management actions, although the importance of continuing to explore the wood chip option was frequently brought up and stressed in the Project Advisory Board meetings. Starting up the wood chip production in the region from the scratch on the basis of a few pilot installations only, however, may have been too challenging for the project of this size. Some interviewed supply side stakeholders also noted that the wood-chip boilers are not always the cheapest option for the size category of boilers, which the project has been supporting. For further details, see chapter 3.2.1.

Concerning possible future risks with wood briquette supply, it is to be noted, however, that the main market for domestically produced briquettes and pellets in the BiH is for export. Should the demand for these products outside the BiH rapidly grow, this may at some point influence their supply and price in the domestic market.

Recommendation 2: Allocate a significant portion of remaining project resources to strengthening the involvement of the National Biomass Association in activities that support biomass energy system development for public buildings and other sectors.

At the time of the final evaluation, the future of National Biomass Association did not look fully promising. After a very encouraging start, a significant share of the previous members of the NBA seemed to have lost their interest to actively participate in the NBA, which can be observed, among others, by the rate of the paid membership fees for 2014 being just around 5-6 members out of the initially attracted 23 members and the level of activity of the NBA in general. After the MTE, the project has invested some additional resources for equipping the NBA office with required furniture and IT equipment, but otherwise the project strategy for engaging the NBA for meaningful future work, thereby also strengthening its capacity and influence in the promotion of the biomass energy market in the BiH in general, was not really clear yet at the time of the final evaluation. On the other hand, after the initial project support the main responsibility for this is supposed to be with the NBA itself to make the effort sustainable. In this respect, some action plan prepared by the NBA apparently exist and it was reported that some funds were also received from the Municipality of Sarajevo Center for promotion of biomass, but it was not possible to explore these in further detail during the evaluation mission.

Recommendation 3: Set aside sufficient resources for the design of an MRV system for biomass heating conversions based on best international practices on reporting the energy and cost savings resulting from biomass boilers installed in 2012 and 2013.

With support of the Czech funding, a report was finalized for "Identification of Key Stakeholders and Design of Measurement-Reporting-Verification (MRV) system" by largely building on the approved UNFCCC methodologies for CDM projects. While the report presented a good start, the suggestions of the report have not really been effectively followed up in terms of starting MRV based on real, actually monitored data. During the final evaluation, the implementation of this was started, however.

Recommendation 4: Promote energy efficiency with the development of future biomass energy projects in BiH (and similar projects in the region) to enhance the adoption biomass energy and reduce the cost of biomass energy

The recommendation to integrate EE measures with all future UNDP-GEF biomass projects is indeed a good one, but as observed, for instance, in the most recent school installation in Bratunac, could not be fully followed up, presumably due to the lack of required financial resources. The available resources were

used, however, to the extent possible to complement the biomass installations with lower cost EE measures such as cleaning the heat distribution system (radiators etc.) and installing thermostatic valves.

Recommendation 5: Extend the project terminal date from December 2013 to December 2014 to allow sufficient time for the Project to obtain approvals, source co-financing, and complete 10 biomass boiler installations.

The project was extended until December 2014, as suggested by the MTE.

No major recommendations were made in the PIRs, except urging the project to continue its fund raising activities to facilitate the implementation of as many biomass energy projects as possible. A recommendation of the GEF OFP in the PIR 2012 was to investigate options and modalities of greater inclusion of the private sector and hence promote local entrepreneurs and the formation of a local biomass market.

As indicated before and also later in this evaluation report, the adaptive management actions of the project to leverage additional financial resources to expand the number of biomass energy projects in BiH have indeed been noteworthy and can be considered as highly successful leading to replication of fuel switching projects not only in the Srebrenica, but also for other public buildings in the BiH such as a hospital in Nova Bila, kindergarden in Bosanska Krupa and Mostar and plans for fuel switch in Cantonal hospitals in Bihac and Goražde.

3.2.4 Project Finance

At mid-October 2014, the disbursement of the GEF resources stood at USD 861,850 USD which is approximately 90 % of the total GEF resources. The remaining 105,000 USD will be spent during the rest of the year for the final tranche payment of the biomass boiler installation in the elementary school „Vuk Karadzic“ in Municipality Bratunac, remaining consultancy fees, final conference of the project and planned end of the project publications, thereby facilitating the financial and operational closure of the project by 31st of December, 2014, which is in schedule for the agreed revised closing date. A summary of the project financing is presented in table 3.2.1 below.

Table 3.2.1 Project disbursements by the end 2013 and the budgeted amount for 2014 versus the original budget in the project document

	BL	Project Budget in the Project Document					Disbursement				Budget 2014 (USD)	Total (USD)
		Year 1 (USD)	Year 2 (USD)	Year 3 (USD)	Year 4 (USD)	Total (USD)	2009-10 (USD)	2011 (USD)	2012 (USD)	2013 (USD)		
Outcome 1	71200	19 400	19 400	19 400	21 800	80 000	11 094	8 202	9 146	1 580	5 000	35 022
	71300	77 200	38 000	18 400	2 400	136 000	18 017	19 752	16 779	7 650	4 000	66 197
	71400	0	0	0	0	0	20 108	25 180	22 200	820	16 000	84 308
	71600	4 625	5 400	4 625	5 400	20 050	3 992	4 287	8 279	0	2 000	18 558
	72100	0	0	0	0	0	24 205	6 582	79 219	94 459	159 305	363 769
	72800	0	60 000	120 000	120 000	300 000		0		0		0
	74500		1 000	10 000	3 000	14 000		467	551	717	500	2 235
	76100						-153	13	-140			-280
	Total	101 225	123 800	172 425	152 600	550 050	77 261	64 483	136 035	105 226	186 805	569 810
Outcome 2	71300	15 000	5 000			20 000		2 888	4 657	0	0	7 545
	72100	0	0	0	0			10 000	167	0		10 167
	76100							-342	-342			-684
	Total	15 000	5 000			20 000	0	12 546	4 482	0	0	17 028

Outcome 3	71200	7 050	7 050	16 050	11 850	42 000	2 986	3 250	6 944		5 000	18 180
	71300	39 000	27 000	31 000	27 000	124 000	6 293	79	1 453	10 163	4 000	21 987
	71400									19 600	19 950	39 550
	71600	5 100	4 525	4 650	4 525	18 800	6 069	7 672	2 794	3 762	1 000	21 296
	72100	30 000	30 000	30 000	30 000	120 000	66 921	71 805	57 844	7 500		204 070
	74500	6 750	6 750	6 750	8 750	29 000	5 435	6 807	4 634	790		17 666
	76100						13	35	49			97
	Total	87 900	75 325	88 450	82 125	333 800	87 715	89 648	73 718	41 815	29 950	322 846
Outcome 4	71300	14 750	14 750	14 750	14 750	59 000				0	0	0
	71400						10 342	13 537	11 980	11 853		47 711
	72100	1 000	1 000	1 000	1 000	4 000	3 077	586	5 740			9 403
	76100						51	0				51
	Total	15 750	15 750	15 750	15 750	63 000	13 470	14 123	17 721	11 853	0	57 166
TOTAL	219 875	219 875	276 625	250 475	966 850	178 476	180 800	232 299	158 910	216 755	966 850	

Budget code explanations:	
71200	International consultants
71300	Local consultants
71400	Contractual services individuals
71600	Travel
72100	Contractual Services companies
72800	Equipment
74500	Miscellaneous
76100	Foreign Exchange Currency Loss

The amounts and allocation of the GEF funds between the different budget lines look appropriate and in line with the planned and implemented project activities. By comparing the actual disbursements to the originally budgeted and approved amounts in the project document, some major changes between the different budget lines are apparent (in particular within budgets for Outcome 1 and 3), but by taking into account the reported and actually observed results, these have been likely due to different administrative reasons than from changing the actual purpose of use of those funds.

Similar to other projects using the UNDP direct implementation modality (DIM), no project specific financial audits are required for such projects, but the financial audit is conducted for the entire UNDP DIM portfolio by looking its implementation and financial management as a whole and by selecting a random sample of projects from the portfolio for a more detailed review. In the most recent audit, the GEF project subject to this evaluation was selected as one those projects, but no defaults and violations of UNDP financial management and accounting rules were found that would call for corrective action. In the audit conducted in September 2014⁴ by the UNDP Office of Audits and Investigations (OAI), the office received the highest audit rating of “Satisfactory” meaning that “Internal controls, governance and risk management processes were adequately established and functioning well. No issues were identified that would significantly affect the achievement of the objectives of the audited entity.” In all the procurement, the project has followed the UNDP procurement guidelines and regulations.

For project co-financing, the initially budgeted amounts versus the actually realized co-financing, as reported by the project management, are presented in table 3.2.2

⁴ <http://audit-public-disclosure.undp.org/>

Table 3.2.2 Achieved project co-financing at the time of the final evaluation versus the budgeted amount in the project document

Anticipated co-financing in the project document			
<i>Source</i>	<i>Type</i>	<i>Amount (USD)</i>	<i>Comments</i>
Narodno Grijanje (a private company)	In-kind ⁵	300,000	Initially anticipated for financing boiler installations by Energy (Heat) Supply Contracting modality, but this co-financing was lost already before the project start as the company went out of business
UNDP BiH	Cash	1,302,100	Contribution of the forestry sector related activities of the UNDP Srebrenica Regional Recovery Program
UNDP BiH	In-kind	20,000	Cost-sharing of the project management costs by contributions of the the UNDP BiH Environment Portfolio Team
Total		1,622,100	
Obtained co-financing at the end of the project			
<i>Source</i>	<i>Type</i>	<i>Amount (USD)</i>	<i>Comments</i>
Foreign Ministry of the Czech Republic	Cash	150,000	Investment in boiler installations (130k) and technical assistance/ advice (20k) for structuring heat supply contracts, development of a MRV system and supporting the organisation of a seminar
UNDP	Cash	1,300,000	Contribution of the forestry sector related activities of the UNDP SRPP Forestry and Employment project (finalized before the project start)
UNDP	Cash/ In-kind	300,000	Co-financing of boiler installations and complementary EE measures in the targeted buildings + administrative and technical backstopping by local SRRP office in Srebrenica during project implementation
FBiH Environmental Protection Fund	Cash	35,000	Co-financing of fuel switching projects in the FBiH area
Cantonal government of Gorazde town	Cash	70,000	Co-financing of a biomass boiler installation in the Cantonal Hospital of the Gorazde town.
Bratunac and Srebrenica municipalities	Cash	25,000	Co-financing of the pilot biomass boiler installations in the schools of Srebrenica and Bratunac
UNDP Green Economic Development Program	Cash	270,000	Project design, biomass boiler system installations and construction works of the three public buildings in the Federation of BiH. These buildings include a hospital in Nova Bila town, kindergarten in Krupa town and Center for children with special needs in the town of Mostar
Total		850,000 2,150,000	without the UNDP SRPP Forestry and Employment project with the UNDP SRPP Forestry and Employment project

3.2.5 Monitoring and evaluation: Design at the entry and implementation

The design of the monitoring and evaluation systems at the entry has relied on the standard UNDP requirements, including annual Project Implementation Reviews (PIRs) and the project Mid-Term Evaluations completed on time. In addition, the progress of the project has been monitored on an ongoing basis by regular Project Board and Project Advisory Board meetings. In the interviews during the final evaluation mission, all PAB members expressed their satisfaction on the way the PAB has worked and that they have received relevant and timely information throughout the project implementation to perform their expected duties.

From the start of project implementation, and as indicated in the M&E instructions within the ProDoc, a small team consisting of local and international expertise was formed to lead the impact monitoring tasks within the project. According to the project management, “the team has followed the implementation results throughout the project until last installations (when it was clear that no other activities will be conducted and when the budget portion for M&E activities had been spent), The risks, issues and critical occurrences (whatever their severity might be) have been almost on a weekly basis evaluated and, as needed, inserted into the “Risk and Issues” log of the UNDP Atlas system. The software allows for recording of accomplishments and delays, risks and follow-up actions to mitigate risks,”

⁵ Defined as an in-kind contribution in the project document, but if realized in the originally anticipated form of investments for Heat Supply Contracts would have actually been closer to a cash than an in-kind contribution.

Specific emphasis both in the project design and during its implementation has been placed on monitoring the impact of the project's awareness raising activities with studies and surveys done both at the beginning and mid-term of project implementation. The results have been used in planning of further awareness raising and capacity building activities.

The weakest points of the project monitoring and evaluation have been the lacking MRV systems to obtain the actual fuel consumption, heat generation and related GHG reduction data from the newly installed biomass boilers as well as the lack of a systematic effort to measure and/or assess the achieved thermal comfort in the retrofitted buildings and comparing that with the baseline situation. No such activities were included in the original project design either, but were recommended by the project's mid-term evaluation. Efforts towards this direction were started during the final evaluation, but would have been worth starting already earlier.

Another observed weak point was the quality control of the PIRs, since due to some software problems or otherwise the targets, for instance, in the last PIR of 2014 against which the progress of the project was reported were not really consistent with those of the project results framework and did not really make much sense in general, which has gone unnoticed through the entire, multi-step PIR approval process at the different levels. The achieved GHG reductions have not been reported and requested in the PIRs at any point, although being one of the main indicators to measure the project impact. A report on "Calculation of reduction of greenhouse gas emissions before and after implementation of energy efficiency measures – replacement of an existing boiler with a new biomass boiler in four (4) primary schools and one (1) public institution" was finalized in September 2014, but even this is based more on theoretical calculations than on actually monitored and/or measured data. For the type of projects supported, the difference in results between the theoretical approach and the data obtained from actual monitoring of fuel consumption of newly installed boilers can be quite significant, which is why the latter is definitely recommended as the preferred and actually the only credible approach to report the project impact.

By taking into account all of the above, the rating for project's monitoring and evaluation is considered as Moderately Satisfactory (MS).

3.2.6 Implementing Partner implementation/execution, co-ordination and operational issues

The project was implemented based on the UNDP Direct Implementation Modality (DIM). The project management arrangements were slightly amended after the finalisation of the project inception report by splitting the Project Board into:

- 1) The new Project Board (PB) comprised of representatives from the BiH Ministry of Foreign Trade and Economic Relations (MoFTER) and UNDP Programme staff with the mandate to review and approve annual work plans and budgets prepared by the project manager; and
- 2) The Project Advisory Board (PAB) consisting of representatives from relevant RS Ministries (Ministry of Agriculture, Forestry and Water Management; Ministry for Spatial Planning, Civil Engineering and Ecology; Ministry of Industry, Energy and Mining; and Ministry of Education and Culture) and UNDP to discuss and coordinate various field level implementation issues and to overview and advise on overall project implementation.

The Project Implementation Unit (PIU) consists of a project manager, associate and assistant who manage the project's technical assistance and pool of experts to support biomass energy development efforts within the MoFTER and various ministries within the Republic of Srpska. According to the project management, the Project Board and Project Advisory Board have been consulted on all important decisions and their views have been taken into account and their approval sought before the final decision.

All members of the Project Advisory Board were interviewed during the evaluation mission and all of them expressed their full satisfaction on the project implementation arrangements and the Board's role there. All PAB members also expressed their satisfaction on having received relevant and timely information throughout the project implementation to perform their expected duties and to express their views in the Board meetings, which have been well documented.

The GEF Operational Focal Point, although not met during the evaluation mission, has had systematic oversight on the project implementation through the annual PIRs, including comments and recommendations on the project progress. For all years of project implementation, the ratings have been either satisfactory or highly satisfactory, thereby being similar to those of the UNDP Country Office and the GEF Regional Technical Adviser.

The good co-operation and co-ordination with as well as the critical support (incl. complementary co-financing) received from UNDP through UNDP Regional Srebrenica project further highlight the **highly satisfactory role (HS)** that the UNDP has played in supporting the project implementation.

3.3 Results

3.3.1 Overall results (attainment of project objectives)

The achieved project results as of October 2014 (i.e. 2 ½ months before the anticipated project closure) are summarized below and compared with the targets of the Project Results Framework (incorporating the changes agreed upon at the project inception phase)

Project Objective: Sustainable reduction of GHG emissions through a transformation of the biomass energy market in Bosnia and Herzegovina.

Target # 1: Schools with retrofitted or new biomass boilers totalling 5,200 tCO_{2e} in direct emission reductions. Although not mentioned in the Project Results Framework, in the narrative of the project document this is specified to mean the emissions calculated over the 15 years' default lifetime of the boilers installed.

Based on the complementary information provided during the final evaluation on the fuel consumption of the installed biomass boilers in two schools (primary schools "Branko Radičević" in Bratunac and "Prva osnovna škola" in Srebrenica) for one heating season (2013-2014) and by assuming close to similar fuel consumption per installed kW by the biomass boilers in the two other schools ("Vuk Karadžić" in Bratunac and "Kosta Todorović" in Skelani), the total direct GHG emission reduction over the default lifetime of 15 years of the installed boilers in these four schools can be estimated at approximately 3,700 tCO_{2e}. The biomass projects influenced by the project in other regions of the BiH can add to this at least by an equivalent amount, and likely much more, by including projects such as:

- Bihać City Cultural Center: replacement of heating system from fossil fuel to biomass pellets with financial support from UNDP, USAID, Bihać Municipality and Government of Unsko-sanski Canton;
- Bihać City Higher School for Arts (Umjetnička srednja škola): biomass heating system boilers for cultural monument and a museum;
- City Bosanska Krupa Dom Zdravlja (Health care center) Bosanska Krupa: replacement of on fossil fuel boiler with biomass pellet boiler with financial support from the Municipality of Bosanska Krupa, Government of Una-Sana Canton, the Federal Ministry for Spatial Planning, and UNDP;
- City Bosanski Petrovac High School: replacement of old 1973 wood stove by biomass pellet boiler with financial support from UNDP, Municipality of Bosanski Petrovac and Government of Una-Sana Canton;

- City Velika Kladuša kindergarten school: The fossil fuel heating system has been replaced by a biomass pellet boiler
- Hospital Nova Bila : replacement of the old boiler with the new pellet boilers
- Center for Children with Special Needs located in the town of Mostar – The fossil fuel heating system has been replaced by a biomass pellet boiler
- Town of Krupa – kindergarten – The fossil fuel heating system has been replaced by a biomass pellet boiler
- Currently in the financial allocation stage are two significant biomass boiler installations (where project designs have been completed) for the hospitals in Bihać town and town of Goražde.

For further details, see table 3.3.1 below.

Table 3.3.1 Preliminary, still inaccurate estimates of the project impact (pending the completion of the recommended M&E activities)

Name of the building	Installed new biomass boiler capacity	Type of fuel and estimated annual fuel consumption	Estimated annual GHG reduction tCO ₂ eq	Estimated GHG reduction over 15 years (tCO ₂ eq)
Projects facilitated directly by the project				
Primary school "Branko Radičević", Bratunac	(200 + 250) kW	Briquettes: 50 tons (est.)	60	900
Primary school "Vuk Karadžić", Bratunac	1 x 550 kW	Briquettes: 60 tons (est.)	76	1 140
Primary school "Kosta Todorović", Skelani	(50 + 250) kW	Briquettes: 30 tons (est.)	38	570
Primary school "Prva osnovna škola", Srebrenica	(250 + 300) kW	Briquettes: 57 tons (mon.)	72	1 080
Public utility company , Milici	1 x 40 kW	Pellets: 4 tons (est.)	3	45
Subtotal	1,890 kWp	201 tons	249	3 735
Projects facilitated indirectly by the project				
Bihać City Cultural Center	2 x 300 kW	Pellets: 62 tons (est.)		
Bihać City Higher School for Arts				
Bihać City Health care center	1 x 200 kW			
Health care center, Bosanska Krupa	2 x 300 kW	Pellets: 86 tons (est.)		
Kindergarten, Bosanska Krupa	160 kW	Pellets: 13 tons	27	
High School, Bosanski Petrovac				
Kindergarten, Velika Kladuša				
Center for children with specific needs, "Los Rosales", Mostar	250 kW	Pellets: 22 tons	16	
Kindergarten, Bosanska Krupa				
Hospital Dr. Fra Mato Nikolić, Nova Bila	1,800 kW	Pellets: 360 tons	350	
Municipal building, City of Cazin	2 x 250 kW	Pellets: 86 tons (est.)		
Cantonal hospital Gorazde.				
Cantonal hospital, Bihac				
Subtotal				
In planning phase				
Srebrenica Municipal Building and High School	2 x 200 kW			

Target # 2: Cumulative GHG reduction of 80,000 tonnes of CO_{2eq} by 2020 by retrofitting or installing biomass fired boilers in BiH as project's indirect impact.

Neither the project document nor the inception report is completely clear on whether this means the cumulative GHG reduction by 2020 or the cumulative GHG reduction from the boilers installed by 2020 over their default lifetime of 15 years. This indirect GHG reduction target was also not included into the Project Results Framework, although presented as a specific target at the project objective level in the narrative of the Project Document. Further clarification on how this was calculated is presented, however, later in the project document (page 5) assuming that "if 500 schools (out of the total of 2,300) enter the scheme by 2020, the project could stimulate CO_{2e} savings of 40,000 tonnes. There is also immediate potential for replication in other municipal buildings, such as hospitals with autonomous heating systems with further relevance to medium sized businesses, particularly those in rural areas. The project estimates potential savings of 200,000 tonnes in CO_{2e} by 2020 from all these areas of potential replication or 80,000 tonnes using a GEF causality factor of 40%."

At the end of the project, it can claim to have had an impact either directly or indirectly on the installation of biomass boilers in at least 20 municipal buildings of different type (schools, hospitals, municipal administrations etc.) and this number is likely to grow in the coming years. Obviously, this is still very far from the set target for the project's indirect impact, but rather than due to the failed project implementation, this mismatch is resulting from the highly unrealistic target setting of the initial project design, especially as it concern the possible speed of market transformation.

For Outcome 1, the targets presented in the Project Results Framework consist of:

Target # 1: 10 schools with retrofitted or new biomass boilers totalling 5,200 tCO_{2e} in direct emissions reductions (reduced at the inception phase from 20 schools and 5,837 tCO_{2e}, respectively).

At the time of the project closure, the project can claim to have contributed directly to the realisation of 4 biomass energy conversation projects in schools, with the summary of the projects provided in table 3.3.1 i.e. somewhat short from the agreed target of 10. At the same time, however, it can be noted that the average size of the boilers in setting the initial target of 20 schools was estimated at 60 kWp per school (corresponding to the total capacity of 1,200 kWp), while the total capacity (in terms of installed kW) of those 4 schools already significantly exceeds this initial target. For the targeted direct greenhouse reduction impact, however, the project seems to fall again short from the agreed 5,200 tCO_{2e} target due to the lower annual fuel consumption per installed kW than anticipated by the initial project design.

Target # 2: Business model (heat service contracting) replicated in at least 2 other regions

The heat service contracting in the form of BOOT was highlighted in the narrative of project objective (in project document) as a key vehicle for addressing the financing barriers of municipalities. For projects implemented in the pilot region of Republic of Srpska, it can be concluded, however, that the project failed to demonstrate sustainable, new private sector driven financing mechanisms, but all projects were financed by traditional grant financing composed by the project's own and leveraged new co-financing resources. A main barrier to introducing heat supply contracting modality in the Republic of Srpska is the current public procurement law, which prevents public entities to conclude multi-year heat supply contracts, which would be required for any new investments under the heat supply contracting modality and which legal barrier was not taken into account at the project design phase.

On the other hand, the project has been able to promote the heat supply contracting modality in the Federation of BiH with such contracts in place (as of October 2014) in the regions of Zenicko-Dobojski, Srednjobosanski, and Canton 10. In this respect, this target can be seen as having been satisfactorily met.

For Outcome 2, the targets presented in the Project Results Framework consist of:

Target #1: 250 tonnes (approx 900 m³) per year of sustainably sourced (certified) biomass fuelwood (chips or logs) supplied to project boilers at a competitive price.

The total annual wood briquette consumption of the biomass boilers, the installation of which has been facilitated by the projects so far, can be estimated at about 200 tonnes per year, which in terms of the heating value (3,4 TJ) exceeds the heating value of 250 tonnes of wood chips or logs (equivalent to 2,5-2,6 TJ) by about 30%. Based on information and means of verification obtained by the project management, all the pellets and briquettes used by the boilers supported by the project have a FSC certificate. The certification related activities were primarily supported by the “UNDP-SRRP Forestry for Employment Project” together with encouraging and supporting the local wood processing industry such as saw mills to turn the previous waste (saw dust and other wood residues) to marketable products such as briquettes and pellets. The price of pellets and briquettes is corresponding with the common market prices of these products in the BiH and they were considered as cost effective alternatives to the previously used fuel oil also by the interviewed final beneficiaries. Although for the reasons discussed earlier in this report, the originally planned type biomass fuel had to be changed from wood chips to briquettes and pellets, this sub-target in general can be considered as successfully met.

Target# 2: Perceptions of fuel supply risk reduced by 50% based on ‘consumer confidence’ survey.

For the first 2013-14 heating season with newly installed biomass boilers, no problems with fuel supply were reported and there was no indication that this would be a problem for the coming heating season either. In this respect, the impression obtained during the evaluation mission based on the stakeholder interviews (including the final beneficiaries) was that the future risks with fuel supply were perceived as low. No specific survey on this has been made by the project, however. As concluded in the project’s midterm evaluation: “The Project will not undertake a consumer confidence survey given its limited usefulness to implementing pilot biomass heating systems for Srebrenica schools.” The final evaluation agrees on the rationality of this adaptive management action, but recommends that the fuel supply security in general will be closely monitored and assessed during the eventual follow-up activities, as it provides the basis for the sustainable operation of the already installed boilers and any market growth in the future. For briquettes and pellets in particular, for which the main market is still for export, a situation may be faced at some point of the time, where for limited supply the domestic demand has to compete with the export market influencing both the price and the security of supply.

The project has contributed to reducing the perception of fuel supply risk also by preparing resource assessments for woody biomass residues to secure adequate fuel supply to the installed and planned biomass boilers (see Annex 4 for further detail)

Target# 3: Competition in fuel supply for the 20 biomass boilers exists, signified by supply offers covering 150% of needs.

As discussed already in the previous chapter, for the first 2013-14 heating season no problems with fuel supply were reported and the price was considered as reasonable also by the final beneficiaries. According to the project management, in line with the regulations for public procurement, the schools are usually obliged to seek and receive at minimum three price offers, which has been the case also for the schools in question. As reported in the PIR 2012, the project has tried to promote the competition by being in contact with the members of the Biomass Association in order to elaborate required measures for creating a competitive environment for fuel supply and procurement. The project has also maintained a registry of potential suppliers, to whom the procurement notice for fuel supply to the installed boilers was sent. The school committees have been trained on aspects that they need to specify in their fuel supply procurement requests. According to the project management, companies dealing with wood biomass supply in the

region have increased in line with the growing interest in renewable energy. These companies include a new pellet factory funded by a Dutch investor, which recently started its operation in the project region and which has also shown interest in heat supply contracting modality, should this be allowed by the public procurement law and related regulations of the Republic Srpska.

For Outcome 3, the targets presented in the Project Results Framework consist of:

Target # 1: Survey shows high level of awareness, including use of project outputs, and increased capacities.

As reported in the annual Project Implementation Review of 2014 and supported by the two reports shared with the evaluator during the evaluation mission (see Annex 4.): “A company was selected to conduct awareness-raising activities, which included awareness surveys and knowledge-raising of each of the targeted groups as defined in the methodology (pre- and post-testing). Based on the reports received, an average 30% knowledge increase was noted among participants of the workshop (34 questionnaires were completed). With regard to participants of the project-led high school competition (which included 23 high schools from the entire territory of B&H and 170 participants), an average 20% knowledge increase was recorded based on the 340 surveys completed.”

According to the project management (PIR 2014): An increase in the awareness related to wood biomass and renewable energy and the project’s role in facilitating this has also been noted by several contacts by foreign investors, bi-lateral donors and local private/public interest groups, who have asked for facilitation of different biomass activities within the GEF biomass project, have secured funding for some activities and needed support or have asked for project ideas in this thematic area and by which the project has also managed to leverage significant amount of new financial resources to support the bioenergy market in the BiH. The USD 1 million investment of the Ministry of Foreign Affairs of the Czech Republic in new biomass boilers of the hospital in the Bihac region together with other valuable support provided by the same donor can be specifically mentioned in this context.

Target #2: Biomass energy awareness and capacity score tripled in project area.

This target refers to the scoring methodology suggested in the project document to be used as basis for measuring progress with outcome 3, but during the project implementation (in line with activity 3.3.1 and in consultation with experts, who have conducted similar surveys in the past) the survey questionnaires were decided to be developed based on a more advanced methodology to better measure and monitor the project impact on awareness raising and capacity building related activities. The reported results as well as the interviews conducted during the evaluation mission indicate (by also looking the substantial content of the review criteria of the original methodology suggested in the project document) that the set targets for project’s awareness raising and capacity building activities have been fully met and likely exceeded.

As specific outputs to support enhanced awareness and capacity building on increased used of biomass energy in the BiH, the following can be mentioned:

- A school education programme, including the development, printing and distribution of an educational book “Environment and Energy” and the related training workshop for teachers consisting of 4 modules. These were complemented by different promotional campaigns, including competitions, workshops, street actions and distribution of promotional material. The awareness and knowledge increase was measured through questionnaires and surveys mentioned before.
- A study tour organized for the school directors and representatives of the relevant ministries on potentials and use of biomass in the education sector

- Support for the establishment of the Biomass Energy Association with the initial workshop held in November 2011 with representatives from 30 companies and 3 individuals. The Inaugural Assembly of the Biomass Association took place in December 2011 with the participation of 18 companies and 4 individuals. Supervisory and management bodies were established during the Inaugural Assembly, followed up by the statutes and other required documents. The National Biomass Association was officially registered in May 2012. .
- Organizing with support and in co-operation with the Ministry of Foreign Affairs of the Czech Republic, a conference “Biomass – Fuel of the Future“ with more than 70 participants representing different professional areas (wood processing, forestry sector, mechanical engineering sector, decision makers, public forest companies and potential investors) to share examples of good practices, communicate results of the current activities and brainstorm on required follow up;
- Again supported by the Ministry of Foreign Affairs of the Czech Republic, facilitating knowledge transfer from Czech experts through preparation of two reports, namely: “Identification of key stakeholders and design of Measurement-Reporting- Verification (MRV) system” and “Development of business models for heat service contracting.”

While in general highly supportive and essential to the objective of the project, some concerns about the sustainable impact of some of the outputs listed above were emerging during the evaluation mission. These are discussed in further detail in chapter 3.3.6.

Complementary achievements not reflected in the initial project design, but which can be viewed as highly supportive in promoting sustainable biomass energy market in the BiH consist of:

- Translating and facilitating the adoption of 5 EU standards for solid biomass fuel specification and classes (EN 14961-(1-5):2010)
- Cleaning, repair and balancing of radiators in all elementary schools in the Srebrenica region – an activity mainly funded by the UNDP SRRP project, with biomass project co-financing. As part of the SRRP activities, schools also underwent energy audits. Doors and windows in schools of Srebrenica were all replaced to reduce heat demand, thereby also reducing the required boiler capacity and/or annual fuel consumption (and related costs).

Concerning the latter, the benefits of this integrated approach combining demand side energy efficiency and renewable energy supply were also emphasized by project’s mid-term evaluation, but as observed, for instance, in the most recent school installations in Bratunac, could not be fully followed up, presumably due to the lack of required financial resources. Nevertheless, for future monitoring and learning, the two schools in Bratunac provide a good source of comparison to the Srebrenica school, for which a complete energy efficiency retrofit was made. It was not possible to complete such an analysis in the frame of this final evaluation yet, but is recommended to be followed up during the remaining project implementation period and its planned follow-up activities. In the same study, the potential cost-savings resulting from the implementation of selected EE measures first, thus reducing the heat demand and the capacity of the required heat supply systems can be assessed.

In conclusion and even by taking into account the observed shortcomings compared to the initial, and in some cases overly ambitious, goals, it is evident that the project has had a critical role in boosting the biomass energy market within both political entities of Bosnia and Herzegovina, which growth is likely to continue also after the project closure. **As such, its overall results and contribution to the project objective and its stated targets can be considered as fully satisfactory (S).**

3.3.2 Relevance

The key criteria for assessing the project relevance have been defined in the UNDP guidance for terminal evaluations⁶ as follows:

- the extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time;
- the extent to which the project is in line with the GEF Operational Programs or the strategic priorities under which the project was funded.

Further it is noted that, retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.

The project was approved for funding under the Climate Change Strategic Program 4: “Promoting sustainable energy production from biomass” of the Focal Area Strategies and Strategic Programming for GEF-4. As successful outcome for this strategic program “the adoption of modern and sustainable practices in biomass production, conversion and use as energy” with indicators such as “tons of CO₂e avoided; the adoption of modern biomass conversion technologies, improved efficiency of biomass energy use, kWh of electricity and heat generated from biomass sources, and energy services produced on the basis of biomass” were listed, while also emphasizing the need to ensure “that biomass energy use is sustainable and does not, therefore, contribute to deforestation, reduced soil fertility, or increased GHG emissions beyond project boundaries.” The topic and the stated targets of the project are in accordance with this expected outcome and the principles outlined above have been fully respected in the project design.

The section dealing with the country drivenness in the project document refers to the Mid-term Development Strategy of Bosnia and Herzegovina, which has emphasized environment protection and energy savings. It calls for the energy sector reform under nine goals. Among these are integration with international markets, improvement of energy efficiency, market liberalization, protection of the environment and increase the use of renewable energy sources.

The National Environmental Action Plan (NEAP) also proposes energy efficiency measures through technology restructuring, better use of energy resources, maximize the use renewable energy, and balanced consumption of domestic and foreign energy resources. These strategies are high level policy documents which at the time of project preparation still had to be developed into concrete implementation strategies.

The forestry sector had been identified in the country Poverty Reduction Strategy Paper as having one of the greatest development potentials in the country. Providing homes for the displaced population and reconstruction of the public sector is one of the priorities on the Government’s agenda. The Government recognizes the need to include energy efficiency opportunities in these activities. For example, the latest Bosnia and Herzegovina Strategy for Economic Development as well as the PRSP put emphasis on energy saving as the indivisible part of the solution for fighting poverty.

Finally, it is mentioned that Bosnia and Herzegovina is a pre-accession country; i.e. it is seeking membership in the European Union (EU) in the medium term. The key governing document between the Balkan countries and the EU agreed in October 2005 is the Energy Community Treaty. Several clauses of this document mention the importance of Kyoto Protocol participation, energy efficiency, and wider use of renewable energy sources. As Bosnia and Herzegovina moves closer to EU, it will have to transpose EU

⁶ <http://web.undp.org/evaluation/documents/guidance/GEF/UNDP-GEF-TE-Guide.pdf>

legislation on energy efficiency, in which one the key directives is the Directive on Energy Performance of Buildings, requiring strict observance of energy efficiency standards. At the time of the project approval, this was complemented by the EU Directive 2009/28/EC “on the Promotion of the Use of Energy from Renewable Sources” with direct relevance to the project topic.

By taking into account all of the above and as further confirmed by the interviews during the project evaluation mission as well as by the observations of the project mid-term evaluation, **the project can be considered as fully relevant (R)** addressing some key barriers to exploit the vast, still largely unutilized biomass energy potential in Bosnia and Herzegovina, while also contributing to the national strategic priorities in the energy and environmental field together with those of the UNDP and the GEF. No such changes have taken place in the project environment and other circumstances during its implementation either that would have diminished this relevance.

3.3.3 Effectiveness and Efficiency

For project effectiveness, the extent to which the project objective has been achieved or how likely it is to be achieved was extensively discussed already in chapter 3.3.1. **As such, the satisfactory rating (S) is restated for project effectiveness.**

For project efficiency, the extent to which results have been delivered at the least cost (also called cost-efficiency) is to be assessed.

For a start, it can be said that for a medium size project, the results achieved up to date are indeed noteworthy. The project management has demonstrated excellent financial management skills by using adaptive management to match the expected results and available financial resources with the external circumstances, which were not always favouring the least cost approaches. An example of this are the current public procurement laws in force in the Republic of Srpska, which prevented the financing of biomass installations by the initially planned heat supply contracting modality by the private sector. This financing modality would have obviously provided a more cost-effective approach to financing biomass energy installations than direct grant financing, but this was out of the reach of the project to change during its implementation.

Typical for RE barrier removal projects trying to promote small decentralized RE applications, including a limited number of relatively small pilot projects, the project costs vs. the anticipated direct project impact are relatively high, exceeding USD 200 per ton of CO_{2eq} for the direct impact that can be observed up to date. The essence of the project is, however, in its indirect impact by facilitating broad replication of biomass energy projects and leveraging new financial resources for that throughout the BiH by first opening the market and raising the confidence of the key stakeholders on viability of biomass as an energy source. With the initially anticipated indirect benefits of 80,000 tons of CO_{2eq} reduced, the GHG abatement costs would be in the range of USD 12 per ton of CO_{2eq}.

By taking into account the above, it can be concluded that in the light of the achieved overall results up to date in significantly raising the awareness of the key stakeholders and the skilful financial management of the available project resources and their use in leveraging additional financial resources to compensate for those co-financing resources that were lost before the project even started, **the overall efficiency of the project can be rated as fully satisfactory (S).**

The extension of the project duration with just one year from the originally designed ending date has not been considered as a negative factor in evaluating the efficiency of the project since the extension clearly has had a positive impact on the final project results. As such, it can be considered as a positive example

of successful adaptive management rather than a negative factor resulting from inefficient project implementation.

3.3.4 Country Ownership

As already discussed in chapter of 3.3.3, the project design is consistent with the key strategy documents of both political entities of the BiH at that time. The importance and benefits of the project and increased utilisation of biomass as a domestic energy source in general were also unanimously emphasized in all stakeholder interviews conducted during the evaluation mission, including RS ministry representatives, representative of the RS State Forest Company, selected private sector representatives as well as the targeted final end users.

As evidenced by the annual Project Implementation Reviews as well as by the minutes of the Project Advisory Board meetings, the country representatives both at the state level and the Republic of Srpska entity level have actively participated in the project implementation and decision making. The Project Board and Project Advisory Boards have been consulted on all important decisions and their approval sought before the final decision. The compositions of the Project Board and the Project Advisory Board can be considered as adequate by taking into account the scope of the project.

On the negative side, the interviews conducted during the evaluation mission revealed that while the interviewed Government stakeholders in general were highly satisfied with the results of the project, not much of those have yet been taken into account in the related policies and strategy work of the interviewed RS ministry representatives. As an example, the strategy documents of the RS Ministry of Education can be mentioned, which haven't incorporated any provisions yet to promote the greater use of biomass and/or integrated EE and RE for meeting the schools' energy needs, while also improving the thermal comfort and reducing the schools' heating costs. Similarly, the Renewable Energy Action Plan of the RS Ministry of Industry, Energy and Mining was finalized in May 2014, but it does not include any targets yet for the use of biomass as an energy source for heating.

3.3.5 Mainstreaming

While the level of mainstreaming of the project and project results to the relevant Government strategies was already discussed in the chapter 3.3.5 above, the UNDP Guidance for Terminal Evaluation calls for assessment to what extent the project is "mainstreaming other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and women's empowerment.

The United Nations Development Assistance Framework (UNDAF) for Bosnia and Herzegovina for 2010–2014 (signed in March 2009) was defining four main outcomes to set the direction of UN system development assistance for the years 2010-2014, including:

UNDAF Outcome 1: Democratic Governance: By the end of 2014, Government with participation of civil society implements practices for more transparent and accountable governance and meets the requirements of the EU Accession process.

UNDAF Outcome 2: Social Inclusion - By 2014, Government develops and implements policies and practices to ensure inclusive and quality health, education, housing and social protection, and employment services.

UNDAF Outcome 3: - By the end of 2014, Government meets requirements of EU accession process and Multilateral Environment Agreements (MEA), adopts environment as a crosscutting issue for participatory

development planning in all sectors and at all levels, strengthens environmental management to protect natural and cultural resources and mitigate environmental threats.

UNDAF Outcome 4: Human Security - By 2014, Government adopts policy, regulatory and Environment institutional frameworks to address human security challenges, including threats posed by communicable diseases and disasters, landmines and small arms and light weapons, armed violence and also addresses issues of migration and women, peace and security.

By seeking to improve the thermal comfort of schools and other public buildings, to create new jobs in the biomass energy sector, to reduce both local and global environmental threats thereby also contributing to the EU Acquis and other international agreements of the BiH and to promote the sustainable use of the natural resources of the country, the project objectives are aligned with and can be seen to contribute especially to UNDAF Outcomes 2 and 3.

The discussions with the UNDP senior management during the evaluation mission also revealed strong interest of UNDP to continue to follow up the ground work laid by the project as a part of its new programming cycle.

Concerning the gender aspects, it was concluded in the PIR 2012 that “the project will support implementation of the B&H Gender Action Plan Chapter III, Activity 2, aiming at steering the economy in the direction of sustainable exploitation of natural resources of domestic regions through use of local wood residues for the production of the biomass feedstock. Additionally, by increasing the acceptance of biomass energy and raising awareness on the benefits of biomass use, the project will contribute to implementation of Chapter XIV, Activity 10.” Working closely with primary schools of three municipalities by improving their heating systems, the project has and is directly benefitting the children working there, of whom at least half is girls, by providing a better educational and working environment for them

3.3.6 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: 1) financial risks, 2) socio-economic risks, 3) institutional framework and governance risks; and 4) environmental risks. It is also to be noted that the assessment below is primarily based on the situation analysis in the project area i.e. the Republic Srpska due to the fact that all discussion with the public sector representatives during the project evaluation mission were conducted for this entity only. Information on the situation in the FBiH is included only to the extent that this information was possible to obtain from other sources.

Considering the financial risks, the schools with installed boilers are likely to continue their operation also after the project since wood briquettes clearly represent a cheaper option than using fuel oil for heating. As such, the rating for project’s financial sustainability at the outcome level is considered as Likely (L)

By looking the issue from the future market growth point of view, it can be noted that several biomass conversion projects in the area of FBiH have already been implemented without direct cost-sharing of the GEF project. Furthermore, the legislation in the FBiH enables multi-year heat supply contracts, which may make it easier for the public entities to leverage private sector financing for them.

In the RS, on the other hand, most biomass energy projects realized so far have been entirely or partially financed by donor grant funding, which together with the current legal framework preventing the effective engagement of the private sector to invest in biomass energy through multi-year heat supply contracts as well as the lack of active promotion of biomass energy for heating in the related Government strategies (as

discussed in chapter 3.3.5) is raising some concerns about the financial sustainability of the project from the continuing market growth point of view.

For socio-economic risks, it can be concluded that the current level of awareness about the benefits and possible ways of increasing the exploitation of the abundant forest resources and residues of the BiH for energy use is already at the high level. The integration of concrete measures to support this through the relevant Government policies, strategies, applicable incentives and other financial support is still largely missing, however, and there were no indications that this would change in the near future. As such and similar to the rating of the financial sustainability, no major socio-economic risks are foreseen that would jeopardize the outcomes already achieved, but from the future market growth point of view i.e. for reaching the project objective, such risks exist. Given the above, at the outcome level the socio-economic sustainability is considered as Likely (L).

For institutional framework and governance risks, the specific situation of Bosnia and Herzegovina consisting of two, largely autonomous political entities having its own regulations and administration governing environmental and energy issues with rather limited co-ordinations is placing some obstacles to the sustainability and effective follow-up of the project results at the national level. For the forestry sector, for instance, it was stated already in the project document that “the approaches of the two political entities are insufficiently integrated and coordinated” resulting in gaps in planning and implementation and lack of coordination between forestry and the wood processing industry. The situation in this respect has changed little during the project implementation. On the other hand, effective follow-up of the project results within both entities even with the current institutional framework is fully plausible. Again at the outcome level, however, no immediate institutional and governance risks are foreseen that would jeopardize the continuing operation and sustainable fuel supply to the boilers already installed. As such, the rating for sustainability versus this risk category at the outcome level is similar to the previous one i.e. “Likely (L)”.

From the environmental point of view, with the current speed of enhancing the biomass energy use based primarily on the available wood residues and by further advocating for the use of certified biomass energy resources only, the environmental risks can be minimized. As a result of eventual rapid expansion of the biomass energy market and related rapidly growing demand for biomass fuels, the environmental risks cannot be entirely neglected, however. They are manageable, but have to be effectively addressed. At the outcome level the environmental risks are considered as negligible. Therefore, the rating Likely (L) for environmental sustainability at the outcome level.

3.3.7 Impact

The GHG intensity of Bosnia and Herzegovina (calculated on the basis of the primary energy supply or GDP) is the highest among all Balkan countries (Source: IEA Key World Energy Statistics 2014), while the predominant source of energy used for heating schools and other public buildings in the BiH is fuel oil and electricity (the latter produced for a large share by coal fired thermal power plants.). As such, by continuing growth of the biomass energy market in the BiH, the impact in terms of reduced GHG emissions can be quite significant. Furthermore, there is a significant replication potential for utilisation of the experiences and lessons learnt in other Balkan countries.

4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS

4.1 Summary of Ratings

The given ratings are summarized in table 4.1 below.

Table 4.1 Summary of evaluation ratings

Evaluation Ratings:			
1. Monitoring and Evaluation		3. IA & EA Execution	
	Rating		Rating
M&E design at entry	Moderately satisfactory (MS)	Quality of UNDP implementation	Highly satisfactory (HS)
M&E Plan Implementation	Moderately satisfactory (MS)	Quality of execution – Executing Agency	N/A
Overall quality of M&E	Moderately satisfactory (MS)	Overall quality of implementation/execution	Highly satisfactory (HS)
2. Assessment of Outcomes		4. Sustainability	
	Rating		Rating
Relevance	Relevant (R)	Financial resources	Likely (L)
Effectiveness	Satisfactory (S)	Socio-economic	Likely (L)
Efficiency	Satisfactory (S)	Institutional framework and governance	Likely (L)
Overall project outcome rating	Satisfactory (S)	Environmental	Likely (L)
		Overall likelihood of sustainability	Likely (L)

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

For project design, the evaluation highlights the importance of investing adequate resources and time on proper situation analysis even for smaller projects. Typically for medium-size projects, far less resources are available and allocated for project preparation, although from the viewpoint of the identified (or non-identified barriers), the targeted results and complexity, their implementation can be as demanding as of many full-size projects. While many defaults of the initial project design can be compensated by good adaptive management and in most cases this is unavoidable anyway, such actions typically also delay the project implementation and in the worst case can lead to unnecessary waste of resources, which especially for smaller projects with already stretched resources can be quite damaging indeed.

Inadequate attention on monitoring and reporting has been a weak point in many projects and the evaluated project does not make an exemption in this respect. Although the reported results, for instance, in the annual PIRs may make sense when looked at separately, in most cases they do not address the specific indicators and targets they are meant to, thereby also leading to unnecessary repetition of basically the same results at the project objective and outcome level and in some cases for one outcome after another. As such, greater attention on the concrete monitoring and reporting plan and formats at the project inception and quality control after that going beyond the standard UNDP requirements is recommended.

Another thing is that in the end, the success of all GHG mitigation projects is measured by the actual GHG savings achieved. Similarly, the local stakeholders may be primarily interested in real verified data on the saved and/or produced energy and related costs savings. For this, a proper monitoring plan of the proposed investment projects would need to be developed and agreed upon already during the project design or at latest during the project inception phase. Otherwise, it is easily left without adequate attention until it

may be too late. Typically, the compilation of data from the actual measurements requires at least one full year, but preferably several consequent years to balance the eventual annual variations.

Often the installation of complementary metering equipment is considered just as an unnecessary additional cost item by taking into account the already stretched financial resources of the project, but usually the investment pays back at the time the projects results are expected to be reported to different stakeholders based on real, verified costs savings and/or emission reductions.

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

As mentioned before, the project has clearly had a significant impact in increasing the general awareness on and acceptance of biomass energy as a serious and cost-effective alternative to the use of fossil fuels in heating of schools and other public buildings. Several innovative approaches and good practices have also been tested in the schools to start the education of children on energy and environmental issues already at the lowest grades. Based on the discussions and observations during the evaluation mission, however, they may have remained as a “one shot activity” implemented once, but forgotten after that. During the evaluation mission it was not possible to meet any of the teachers that were trained on delivering the classes on energy and environment so as to clarify to what extent the earlier initiatives may have been followed up and/or still used in their current work. The impression from the discussions with the school directors was, however, that if not formally integrated into the school curricula (based on the request of Ministry of Education), the earlier awareness raising activities may not anymore be replicated for new classes and/or the materials prepared used. As such, some further follow up during the remaining project implementation as well as after that could be organized both at the level of the Ministry of Education and Culture and at the schools with the teachers trained on how to make the effort more sustainable.

The need for strengthening the monitoring of the already installed biomass boilers was discussed with the project management already during the evaluation mission. It was tentatively agreed with the project management that the project seeks to attach still during the remaining project implementation a heat meter into each installed biomass boiler supported with project funds as well as to agree with the school management on recording the meter readings together with the fuel consumption data at agreed regular intervals and reporting them to UNDP. Furthermore, a strategy and implementation arrangements for measuring and reporting the achieved thermal comfort inside the school buildings during the starting heating season should be agreed upon by relying on relatively cheap measurement and data recording instruments. Although the project will formally end in a couple of months' time, the monitoring should be continued as a part of the planned follow-up activities. Correspondingly, the current cost-benefit and GHG reduction analysis can be updated based on the actually monitored data and performance of the pilot projects rather than relying on the initial theoretical design values.

The original project design included no legal and regulatory component and no such activities were introduced into the project during its implementation either (apart from translating and facilitating the adoption of 5 EN standards for solid biomass fuel specification and classes). Starting with awareness raising activities is appropriate, but future interventions should gradually start to address also the identified legal and regulatory barriers, One of those barriers is within the current Public Procurement Law of the Republic of Srpska, for which the discussion on the required amendments to better support new contacting modalities and to leverage financing for investments, which the municipalities may not afford to make at once by themselves, could be initiated.

Another thing is that the information and conclusions of the project have not really found yet their way to the key policy and strategy documents of the different Government entities such as the Ministry of Education and Culture and the Ministry of Industry, Energy and Mining. The possibilities for further co-

operation with the mentioned entities could be explored as a part of the possible follow-up activities of the project. The elements of the possible follow-up support could include required background studies and updated resource assessments, drafting of action plans (or relevant parts of them), design of possible financial and/or fiscal incentives, standards and regulations for quality control of both the hardware and the design works as well as of the different types of biomass fuels sold at the market etc. Furthermore, for the design of fuel-switching projects, some further training and capacity building may be required for optimizing the design and costs and the desired thermal comfort by an integrated demand side energy efficiency and supply side RE approach. All this subject to an updated situation analysis and needs assessment, however. These are also areas, where opportunities for co-operation with the National Biomass Association may be explored further so as strengthen its existence and eventually broaden its membership base.

Despite the initial project idea of relying on wood chips as the primary type of wood fuel to be used for heating of municipal buildings, the production of them has not really taken off yet in a larger scale. In the interviews with different stakeholders, to great extent this was considered to be because of different organisational and institutional barriers, but there are also issues with suitable machinery, available financing options to purchase such machinery by small companies etc., all of which are aspects that eventually could be supported within planned follow-up activities.

UNDP BiH in general appears to be in an excellent position to continue the effort of promoting the EE and RE agenda in the country with both political entities by maximizing the synergies with its other ongoing projects, The new Green Economic Development (GED) project in particular can be mentioned with partnerships already created with the FBiH Environmental Protection Fund and the RS Environmental Protection and Energy Efficiency Fund for exploring the potential for new financing mechanism. The mutual benefits of co-operation with bilateral donors were already demonstrated during the project implementation and this is worth following up. The planned UNDP follow up project on “Biomass Energy for Employment and Energy Security” would provide an excellent platform to continue to push the bio-energy agenda in particular.

ANNEXES

Annex 1: Terms of reference of the evaluation

Annex 2: Itinerary and summary of field visits

Annex 3: Lists of persons interviewed

Annex 4: List of documents reviewed

Annex 5: Comments by Stakeholders

ANNEX 1: TERMS OF REFERENCE OF THE EVALUATION

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of the GEF Medium-sized project: *Bosnia and Herzegovina Biomass energy for employment and energy security* (PIMS # 3880.)

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

PROJECT SUMMARY TABLE

Project Title:	<i>Bosnia and Herzegovina Biomass energy for employment and energy security</i>			
GEF Project ID:	00054633		<u>at endorsement</u> <u>(Million US\$)</u>	<u>at completion</u> <u>(Million US\$)</u>
UNDP Project ID:	00046049	GEF financing:	966,850	966,850
Country:	Bosnia and Herzegovina	IA/EA own:	1.322,100	1.322,100
Region:	RBEC	Government:		
Focal Area:	CC	Other:	300,000	150,000
FA Objectives, (OP/SP):		Total co-financing:	1.622,100	1.472,100
Executing Agency:	UNDP	Total Project Cost:	2.588,950	2.438,950
Other Partners involved:	Ministry of Foreign Trade and Economic Relations of BiH; Partner Ministries of the RS Entity	ProDoc Signature (date project began):		21.09.2009.
		(Operational) Closing Date:	Proposed: 31.12.2013.	Actual: 31.12.2014.

OBJECTIVE AND SCOPE

The UNDP Bosnia and Herzegovina (within the Energy and Environment Cluster) has implemented activities of the Global Environment Facility (GEF) medium-sized project on BiH Biomass Energy for Employment and Energy Security. The key project objective is the reduction of greenhouse gas emissions, by installing or retrofitting biomass boilers. Project activities aim to support such installations by creating sustainable markets for biomass energy. Domestic benefits include job creation, reduced emissions, and improved quality of heating. The project has targeted the education sector (primary schools) in the three municipalities of Srebrenica region (Srebrenica, Bratunac, Milići).

The project was designed to: remove market barriers to the adoption of sustainable biomass energy services in rural areas of Bosnia and Herzegovina through market transformation, enhance job creation, community poverty reduction and local energy security, to increase market demand for biomass energy, to convince policy makers, financial sector, fuel and technology suppliers and niche markets on benefits and market opportunities for biomass energy and sustainable biomass fuel, to enhance advocacy capacities in biomass energy, to strengthen and expand sustainable fuel supply markets. The project has aimed at

enhancing local experience and awareness of biomass energy providing a firm foundation for these issues to be addressed in the context of larger initiatives to address energy, forest and business policies and legislation.

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.

The objectives of the evaluation are 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.

EVALUATION APPROACH AND METHOD

An overall approach and method⁷ 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. A set of questions covering each of these criteria have been drafted and are included with this TOR (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 Sarajevo (Bosnia and Herzegovina), including the following project sites: Banja Luka, Srebrenica, Bratunac. Interviews will be held with the following organizations and individuals at a minimum:

- Ministry of Foreign Trade and Economic Relations of BiH – GEF operational focal point and Head of the Environment department
- Ministry of Agriculture, Forestry and Water management of RS – steering board members
- Ministry of Education and Culture of RS – steering board members
- Ministry for Industry, Energy and Mining of RS – steering board members
- Ministry for Spatial Planning, Civil engineering and Ecology of RS – steering board members
- UNDP Senior Management staff
- UNDP regional office in Srebrenica staff
- Field technical staff at the infrastructure projects' sites
- Biomass association representative
- Other technical consultants as needed

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

⁷ For additional information on methods, see the [Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 7, pg. 163

EVALUATION CRITERIA & RATINGS

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework ([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	<i>rating</i>	2. IA& EA Execution	<i>rating</i>
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	<i>rating</i>	4. Sustainability	<i>rating</i>
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental :	
		Overall likelihood of sustainability:	

PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US\$)		Government (mill. US\$)		Partner Agency (mill. US\$)		Total (mill. US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

MAINSTREAMING

UNDP 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.

IMPACT

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

CONCLUSIONS, RECOMMENDATIONS & LESSONS

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

IMPLEMENTATION ARRANGEMENTS

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

EVALUATION TIMEFRAME

The total duration of the evaluation will be 16 days according to the following plan:

Activity	Timing	Completion Date
Preparation	2 days	26.09.2014.
Evaluation Mission	7 days	20.10.2014.
Draft Evaluation Report	6 days	05.11.2014.
Final Report	1 day	10.11.2014.

EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission.	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission	To project management, UNDP CO
Draft Final Report	Full report, (per annexed template) with annexes	Within 3 weeks of the evaluation mission	Sent to CO, reviewed by RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft	Sent to CO for uploading to UNDP ERC.

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

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

TEAM COMPOSITION

The evaluation team will be composed of 1 international evaluator. The consultant shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage. The evaluator selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The evaluator must present the following qualifications:

- Minimum 10 years of relevant professional experience
- Knowledge of UNDP and GEF
- Previous experience with results-based monitoring and evaluation methodologies;
- Technical knowledge in the targeted focal area(s)
- Proven track record with policy advice and/or project development/implementation in biomass energy (or renewable energy) related projects in transition economies
- Proven track record of application of results-based approaches to evaluation of projects focusing on renewable energy and biomass energy (relevant experience in the region and within UN system would be an asset);
- Familiarity with priorities and basic principles of projects focusing of biomass energy and relevant international best-practices;
- Knowledge of and recent experience in applying UNDP and GEF M&E policies and procedures;
- Advanced university degree in environmental or relevant field is an asset
- Proven ability and practical experience in monitoring and evaluation of international projects.

EVALUATOR ETHICS

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

PAYMENT MODALITIES AND SPECIFICATIONS

%	Milestone
10%	Upon submission of the evaluation plan and schedule
40%	Following submission and approval of the 1ST draft terminal evaluation report
50%	Following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report

APPLICATION PROCESS

Individual consultants are invited to submit applications together with their CV for these positions. The application should contain a current and complete C.V. in English with indication of the e-mail and phone contact. Shortlisted candidates will be requested to submit a price offer indicating the total cost of the assignment (including daily fee, per diem and travel costs).

UNDP applies a fair and transparent selection process that will take into account the competencies/skills of the applicants as well as their financial proposals. Qualified women and members of social minorities are encouraged to apply.

ANNEX A: PROJECT LOGICAL FRAMEWORK

Project Strategy	Measurable Indicators	EOP Target
<p>Project Objective: The overall project goal is a sustainable reduction of GHG emissions through a transformation of the biomass energy market in Bosnia and Herzegovina.</p>	<p>Number of schools retrofitted or new biomass boilers with GHG reductions</p>	
<p>Outcome 1: Market demand for biomass energy is increased</p>	<p><u>Output 1.1:</u> Number of new small scale biomass energy projects under advanced planning (engineering design stage) / construction in the project area</p>	<p>10 new small scale biomass energy projects <i>as a mid-term target</i></p>
	<p><u>Output 1.2:</u> Number of schools retrofitted or new biomass boilers with GHG reductions</p>	<p>10 schools</p>
	<p><u>Output 1.3:</u> Emission reductions from the use of biomass boilers</p>	<p>5,200 tCO_{2eq} of direct emissions reductions</p>
	<p><u>Output 1.4:</u> Number of regions where business model (heat service contracting) is replicated</p>	<p>At least 2 other regions replicating the business model</p>
<p>Outcome 2: Sustainable biomass fuel supply markets strengthened and expanded</p>	<p><u>Output 2.1:</u> Number of wood-processing companies showing real interest in wood fuel supply to local markets in the project area that have forestry concessions that cover a percentage of the required biomass supply for the 10 boilers, and have MOUs for fuel supply projects</p>	<p>5 companies with MOUs having 200% of fuel required by demonstration projects <i>as a mid-term target</i></p>
	<p><u>Output 2.2:</u> Annual tonnage or volume of sustainably sourced (certified) biomass fuel wood (chips or logs) supplied to project</p>	<p>250 tonnes or 900 m³ per year of sustainably sourced (certified) biomass fuel wood</p>

Project Strategy	Measurable Indicators	EOP Target
	boilers at a competitive price	
	Reductions in the perception of fuel supply risk as measured in a “consumer confidence” survey.	50% reduction as indicated in a “consumer confidence” survey.
	Offers for biomass fuel supply as a measure of competition in the fuel supply business for the 10 biomass boilers	Biomass supply offers that total 150% of the needs of the 10 biomass boilers
Outcome 3: Policy makers, financial sector, fuel and technology suppliers and niche markets are convinced of benefits and market opportunities for biomass energy	“Biomass energy awareness and capacity score” from project survey to indicate improved awareness and capacities of users on biomass issues	Doubling of awareness from surveys <u>as a mid-term target</u>
	“Biomass energy awareness and capacity score” from project survey to indicate improved awareness and capacities of users on biomass issues	Quadrupling of “Biomass energy awareness and capacity score” in project area (see Output 3.3)

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

- Project Document
- Project CEO Approval Document
- Inception Report
- GEF Project Implementation Reviews
- Minutes of the Project Steering Committee meetings
- Mid-term evaluation report

ANNEX C: EVALUATION QUESTIONS

Evaluative Criteria Questions	Indicators	Sources	Methodology
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?			
•	•	•	•
•	•	•	•
•	•	•	•
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
•	•	•	•
•	•	•	•
•	•	•	•
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?			
•	•	•	•
•	•	•	•
•	•	•	•
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
•	•	•	•
•	•	•	•
•	•	•	•
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>Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution</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>Sustainability ratings:</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>Relevance ratings</p> <p>2. Relevant (R) 1.. Not relevant (NR)</p> <p>Impact Ratings: 3. Significant (S) 2. Minimal (M) 1. Negligible (N)</p>
<p><i>Additional ratings where relevant:</i> 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 Form⁹

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: _____

⁹www.unevaluation.org/unegcodeofconduct

ANNEX F: EVALUATION REPORT OUTLINE¹⁰

- 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 Manual¹¹)
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 rated¹²)
- 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:
 - Monitoring and evaluation: design at entry and implementation (*)
 - UNDP and Implementing Partner implementation / execution (*) coordination, and operational issues
- 3.3 Project Results

¹⁰The Report length should not exceed 40 pages in total (not including annexes).

¹¹ UNDP Style Manual, Office of Communications, Partnerships Bureau, updated November 2008

¹² 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.

- 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

(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: _____

ANNEX 2: ITINERARY AND SUMMARY OF FIELD VISITS

Sunday 5.10.2014: Arrival to Sarajevo

Monday 6.10.2014: Briefing with the UNDP staff

Tuesday 7.10.2014: Meetings in Sarajevo with the project consultants and with Biomass Association. Departure to Banja Luka in the afternoon.

Wednesday 8.10.2014: Meetings in Banja Luka with 4 ministries (members of the Project Advisory Board) and the State Forest Company. Departure to Sarajevo in the afternoon.

Thursday 9.10.2014: Travel to the Srebrenica region visiting two schools with installed biomass boilers and a company producing briquettes in Bratunac and one school with combined demand side EE investments and installation of biomass boilers in Srebrenica + a visit to the UNDP project office of the SRRP project

Friday 10.10.2014: Wrap-up meetings with the UNDP staff

Saturday 11.10.2014; Departure from Sarajevo

ANNEX 3: LIST OF PERSONS INTERVIEWED

Monday, October 6th, 2014:

Ms. Amila Selmanagic Bajrovic, UNDP Project Manager

Mr Sanjin Avdić, UNDP Sector Leader, Energy and Environment Sector

Ms. Zahira Virani, UNDP Deputy Resident Representative

Mr. Vanja Curin, Director, Ms. Erna Alihodzic; Company DVOKUTPRO

Tuesday, October 7th, 2014:

Mr. Azdurin Husika (Consultant on biomass cost-benefit studies)

Mr. Nihad Harbas (Consultant on GHG emission calculations)

Mr. Damir Babić (President of the Biomass Association and a director of the company Kovan-producing biomass boilers and pellets)

Wednesday, October 8th, 2014:

Mr. Vladimir Vasilić, Ministry of Education and Culture, RS

Mr. Rajko Đorojević, Ministry of Agriculture, Forestry and Water Management (RS)

Mr. Petar Jotanović, Ministry of Industry, Energy and Mining (RS)

Ms. Ljiljana Stanišljević, Ministry of Spatial Planning, Civil Engineering and Ecology (RS)

Mr. Radenko Laketić, Deputy Manager, Public Forest Enterprise of the Republic of Srpska

Thursday, October 9th, 2014:

Mr. Savo Milošević,, Director of the Branko Radicevic School, Bratunac

Mr. Andrija Mlađenović, Director of the Vuk Karadzic school, Bratunac

Mr. Dalibor Petrović, Head of the Sales Department, Company Petroprojekt,, Wood industry processing company-producing Briquettes

Mr. Fahir Cimic, Local Liaison Officer

Mr. Marinko Backović , Director of the "Prva osnovna škola", Srebrenica

Mr. Mokhtar Ahdouga, Private Sector Development Adviser, UNDP Srebenica Regional Recovery Program

Friday, October 10th, 2014:

Ms.Zahira Virani, UNDP Deputy Resident Representative

Ms. Jasmina Kahvedžić, Head of the Energy Department at the FBiH Environmental Protection Fund

ANNEX 4: LIST OF DOCUMENTS REVIEWED

General documentation

- Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects
- The United Nations Development Assistance Framework (UNDAF) for Bosnia and Herzegovina for 2010–2014
- GEF-4 focal area strategy
- UNDP Country Office Audit Report, September 2014

Project documentation

- GEF approved project document and Request for CEO Endorsement
- Project Inception Report
- Annual GEF Project Implementation Reports for 2012, 2013 and 2014
- Project Steering Committee minutes
- Project Midterm Evaluation

Project Reports

- Biomass Energy Awareness in Bosnia & Herzegovina, with a Special Focus on Srebrenica Region
- Final Report on Awareness, Risk and Capacity Surveying in the B&H Biomass Sector with a Special Focus on Srebrenica Region
- Report on the Outputs and Outcomes of the 'Forestry for Bosniac Returnee' Activity of SRRP, June 2009
- Project Plan and Methodology - Facilitation of biomass association development and enhancement of advocacy capacities within the woody Biomass sector of B&H", June 2011
- Cost-Benefit Analysis of the Bosnia and Herzegovina Biomass Energy Sector – with a Special Focus on Srebrenica Region
- Business Models for Heat Service Contracting (prepared with Czech funding), March 2014
- Measurement, Reporting and Verification (prepared with Czech funding), March 2014
- Contribution Achievement Report (prepared with Czech Funding)
- Analysis of woody biomass residue potential in BiH, with a special focus on Srebrenica, Bratunac and Milići Municipalities
- Calculation of reduction of greenhouse gas emissions before and after implementation of energy efficiency measures – replacement of an existing boiler with a new biomass boiler in four (4) primary schools and one (1) public institution", September, 2104
- Green Economic Development Project Document, January 2014

ANNEX 5: COMMENTS BY STAKEHOLDERS (only in case of discrepancies with evaluation findings and conclusions)