REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title: Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia			
Country(ies):	Serbia	GEF Project ID:[1]	4517
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4382
Other Executing Partner(s):	Ministry of Energy, Development, and Environmental protection	Submission Date: Resubmission Date: Resubmission Date:	25 July 2013 11 Oct 2013 10 January 2014
GEF Focal Area (s):	Climate Change	Project Duration(Months)	48
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐ ➢ For PPP ☐	SP-4 "Promoting Sustainable Energy Production from Biomass	Project Agency Fee ($):	284,500

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Cofinancing ($)
CCM-3 (select)	Favorable policy and regulatory environment created for renewable energy investments	Renewable energy policy and regulation in place	GEF TF	910,000	3,030,000
CCM-3 (select)	Investment in renewable energy technologies increased	Renewable energy capacity installed	GEF TF	1,600,000	23,800,000
CCM-3 (select)	GHG emissions avoided	Electricity and heat produced from renewable sources	GEF TF	335,000	800,000
		Total project costs		2,845,000	27,630,000

B. PROJECT FRAMEWORK

Project Objective: To reduce barriers to accelerate the development of biomass markets in Serbia						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Co-financing ($)**
1. Raising Awareness and Creating Market	TA	Improved capability of local municipalities	1.1: Biomass Support Unit Established and Operational with Team in Place to Support Biomass Projects	GEF TF	357,250	2,000,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

Demand for Biomass Energy		and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia	in Serbia 1.2 Designed and Implemented Training Modules on Biomass Energy for local municipalities and entrepreneurs based upon the UNDP Municipal Biomass Guide 1.3 At least 16 completed regional seminars on biomass energy that employed the designed training module and the Municipal Biomass Guide will be presented (both demand side and supply side) 1.4: Completed studies and preparation of "Serbian Biomass Atlas' 1.5: Incorporated new course on Biomass Energy at the University of Belgrade & Novi Sad 1.6: Completed national public awareness raising campaign on Biomass Energy by the Biomass Support Unit 1.7: Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia prepared by the Biomass Support Unit 1.8 E-trade platform 1.9: Project Website			
2. Policy & Legislative Development Support Related to Biomass Energy	TA	Stronger and more effective secondary legislation related to biomass energy is developed and	2.1: Adopted and implemented technical standards and regulations for biomass energy projects in line with international best practices	GEF TF	130,000	520,000

		approved and adopted	2.2: Policies and regulations to promote biomass supply and its sustainability adopted and implemented 2.3: Appropriate licensing procedures developed and in place to support the long-term development of the biomass market in Serbia			
3. Mechanism for Institutional Support for Biomass Projects in Serbia	TA	Successfully operating Biomass Support Unit, increased capability of municipalities and entrepreneurs to develop, finance, construct, and operate bankable biomass projects	3.1: Developed and adopted National Programme for Supporting Biomass Projects 3.2: At least 20 completed training seminars by the Biomass Support Unit for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the Investment Support Mechanism	GEF TF	510,000	500,000
4. Demonstration Projects - Investment Support Mechanism	Inv	A minimum of six biomass projects are successfully financed, constructed and operating by the end of the project	4.1 Investment Support Mechanism established and sustained through Public Funding Scheme for Biomass Projects under the State Environment and Energy Efficiency Fund 4.2 (three) Agricultural Biomass projects are selected under the Investment Support Mechanism and are developed, constructed and operational by the end of the project 4.3 (three) Wood Biomass projects are selected under the Investment Support Mechanism and are developed, constructed and operational by the end of the project	GEF TF	1,600,000	23,800,000
5. Sustainability	TA	At least 12 additional	5.1 Twelve 12 additional Biomass Projects in Serbia	GEF TF	112,750	800,000

and Replication		Biomass Projects are being supported by the Biomass Support Unit / Investment upport Mechanism (by project end)	are successfully supported beyond those which are partially assisted with GEF funds 5.2 Produced documentary film on the implemented Biomass Energy pilot projects produced by the Biomass Support Unit			
Subtotal					2,710,000	27,620,000
Project management Cost (PMC)[3]				GEF TF	135,000	10,000
Total project costs					2,845,000	27,630,000

C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming co-financing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount ($)
Bilateral Aid Agency (ies)	UNDP	Cash	310,000
Bilateral Aid Agency (ies)	UNDP	In-kind	250,000
National Government	Ministry of energy, development and environmental protection; Ministry of Agriculture, Forestry and Water Management; Ministry of Natural Resources, Mining and Spatial Planning	In-kind	1,800,000
Local Government	Municipality of Alibunar; Municipality of Ruma; Standing Conference of Towns and Municipalities –SCTM; Regional Development Agency of Srem - RRA Srem	In-kind	790,000
Foundation	Serbian Chamber of Commerce; Institute for Standardization	In-kind	680,000
Private Sector	Private sector cofinancing for specific projects: Biogas Holding; Global Seed; Poliester group; NICCO; NetInvest;	Cash	21,600,000
		In-kind	2,200,000
Total Co-financing			27,630,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY: N/A[1]

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Co-financing ($)	Project Total ($)
International Consultants	218,000	20,000	238,000
National/Local Consultants	343,250	95,000	438,250

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

[3]PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[4]

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

The proposed project is in line with the national strategic objective and priorities of the Republic of Serbia as stipulated in the National Energy Strategy for 2015. This document clearly shows that renewable energy and in particular biomass should play an important role in the development of renewable energy in Serbia and calls for at least four bioelectricity projects from agricultural and forest sources. During the PPG phase, six projects (four biogas and two wood CHP ones, totaling 6.9 MWe) expressed interest to join the GEF project. The final project selection/ configuration will be subject to technical assistance and final approval through the EBRD process.
The proposed project will also build upon the Biomass Action Plan for the Republic of Serbia 2010-2012, a joint effort between the Serbian and Dutch Governments. In detail, the implementation of the project will contribute to substantially improve the following barriers that were also stated in the Serbian Biomass Action Plan (2010) :

1) Harmonization of Serbian technical standards on biomass and waste with those of the EU
2) Feasibility study of wood residue collection from forestry in Serbia
3) Development of a communication strategy for renewable energy in Serbia
4) Training for submitting successful project proposals to obtain international funds
5) Biomass demonstration projects according to international and European best practices
6) Development of a manual (guidelines) for applications for bank support – best practices.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities

This project is consistent with GEF Strategic Program 4: "Promoting Sustainable Energy Production from Biomass". The promotion of biomass energy is an area where UNDP has already successfully assisted other countries in the region including Belarus, Latvia, Poland, Slovakia and Slovenia. The project is therefore fully consistent with GEF strategies and programs and falls within an area that UNDP has particular experience.

A.3 The GEF Agency's comparative advantage:

The project falls within an area where UNDP has a comparative advantage through provision of technical assistance projects related to removing barriers for biomass energy. UNDP has successfully implemented five biomass projects within the region and is developing new biomass projects in Croatia, Ukraine, and Georgia. A summary report of the lessons UNDP has learned from implementing biomass projects in the Europe and CIS region can be found at the following website.

http://europeandcis.undp.org/index.cfm?event=show&content_id=BB8D4505-F203-1EE9-B5D5719048A8E1A7

[4] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question

A.4. The baseline project and the problem that it seeks to address:

Serbia, as reported in a good number of recent reports has substantial renewable energy potential, with significant hydro, biomass, wind, solar and geothermal resources. Exploitation of these resources is currently mainly via hydropower plants and non-commercial- mostly inefficient- use of biomass by households.
In the policy domain, a national strategy for increased use of renewable energy resources has been developed in recent years. Renewable energy production has been declared a priority and efforts are continuously being made to facilitate the establishment of clear institutional and regulatory framework and to raise awareness both within the energy sector and general public. However, the strategy is still in early stages of development and declared targets and measures are not yet supported by well-defined actions to be taken by government agencies, authorities or public / private companies.

Recently, the government of Serbia adopted a new set of by-laws that further improves the Energy law. The Decree on Criteria for Privileged Power Producers adopted in January 2013 enables obtaining of a privileged power producer status to all operators using the RES as well as to those that perform activities in highly efficient CHP facilities.

Among the renewables the role of biomass is highly recognized as one of the most important as the source has substantial and diverse potential for future energy exploitation alongside with providing significant outlets to the Serbian economy for rural development, restructure of the agriculture and forestry sectors, job creation and sustainable, efficient use of both land and water resources and prevention of pollution from livestock slurries.
The use of biomass for heat in both households and the industrial sector is significant but still mostly done with inefficient stoves/ boilers.

According to a comprehensive, recent study, more than half (55%) of all households in Serbia used biomass for space heating, cooking and water heating in 2009/2010. Firewood is the dominant fuel, with only around 3% of household using biomass reported that they use pellets or briquettes.
More than 90-95% of wood industry residues are used, with the remainder being waste. Major uses are: industrial heat (62%); pellet and briquette production (28%); and particleboard production (10%).
Agricultural residues, including livestock, are largely unused for energy production but there is growing interest by some agro-industrial sectors in the use of their residues as a cost-effective means to provide space or process heat. In recent years, several companies have installed boilers using residues (straw from soybean and wheat, maize cobs, sunflower husks).

By contrast, electricity production from biomass is currently limited to a small number (four) of recently installed biogas plants in the waste water treatment and agriculture sectors. Installed capacity of individual units is typically around 1MWe and total installed capacity to date is around 4MWe.

• In 2008, the company Alltech Fermin (a yeast production company) started constructing a waste water treatment plant in the municipality of Senta. The process includes biogas production and subsequent production of electricity and heat; partially for self-supply. The power plant has a capacity of 2,500 cubic meter of waste water per day and generates 1.6 MWe and 1.8 MWth. This plant is producing electricity, biogas and fertilizer at the same time and its regular operation started in late 2011. Expected annual production of the plant is around 12.8 GWh of electricity and 14.4 GWh of heat.

• In February 2011, a contract was signed between Lazar Dairy, located in Blace, southern Serbia, and GHD Inc. Company, an American biogas digester construction firm. The digester became fully operational in May 2012. The installed capacity of this power plant is 1 MWe and 1.2 MWth.

• In early 2011, EnviTec Biogas AG (its affiliate EnviTec Biogas South East Europe) signed a contract for the construction of a biogas installation on a dairy cattle farm in Curug (province of Vojvodina) with the aim of processing liquid manure and corn silage to produce heat and electricity. The installation have an electrical capacity of 635 kW and it is become operational by January 2013.The project was assigned by farm operator Velvet Farm, subordinated to the animal feed producing company Global Seeds.

• Finally, the construction of a biogas plant owned by the agricultural company Sava Kovacevic started in 2012. The facility with total investment value of € 5.5 million is financed by Mirotin-Energo from Vrbas and has an installed capacity of 1 MWe and 1 MWth, with expected annual generation of 8 GWh of electricity and 8 GWh of heat. The plant became fully operational in October 2012.

Both the heat and electricity sectors present significant opportunities for the future bio-energy market development in Serbia. Recently KfW has initiated a large project for biomass heat in Serbia, covering biomass use in district heating plants with public ownership only. In the framework of this project, the Serbian government and KfW on behalf of the German government plan to support several district heating companies in their efforts to switch to biomass as fuel and/or to build new biomass-based CHP plants. The envisaged budget for this project is 110 million EUR (100 million € soft loan with 15 years maturity + 10 million € grant). The final number of the district heating companies supported by the project will be determined after the elaboration of pre-feasibility studies.

Thus, to avoid duplication of efforts and increase the added value of the proposed GEF project the work will focus on biomass to electricity technologies in the agricultural (biogas) and forest sectors to facilitate the future deployment of efficient technologies and increase the share of sustainable bioenergy in the Serbian electricity sector.

In summary, based on the preliminary results from the PPG study, the theoretical annual potential supply for biogas is estimated at 23 PJ. In real terms, much of this resource cannot be aggregated among farming units to provide sufficient feedstock that a typical AD unit may require. It is therefore assumed that ~30% of theoretical potential could be technically exploitable (~ 7 PJ). The installed capacity could be 102 MWe.
On the other hand, forest residues in Serbia (e.g. tops, branches and stumps) that are left over at the logging sites and are estimated (from the PPG study) at 2.8 PJ. It is assumed that ~50% of this potential could be exploited for small to medium scale CHP. The installed capacity could be 19 MWe.
Both the biogas and woody biomass technologies at the foreseen scales are fully commercial and their security of supply can be safeguarded with local supply agreements, which will further facilitate the development of biomass/energy crops companies who will enter into long-term biomass supply contracts.

Table 1 below provides an overview of technologies, efficiencies, investment, operation and maintenance costs of key technologies for heat and electricity generation.

Table 1: Technologies, efficiencies and costs (www.biomassfutures.eu; GEMIS database)

Technology	Short description	Efficiency	Investment costs €2010/kW	Fixed O& M costs €2010/kW
Direct co-firing coal	The advantages of co-firing are: the overall electrical efficiency is high (usually around 40%) due to the economies-of-scale of the existing plant and investments costs are low to negligible when high quality fuels as pellets are used. Also, directly avoided emissions are high due to direct replacement of coal. Combined with the fact that many coal-fired power plants in operation are fully depreciated, this makes co-firing usually a very attractive GHG mitigation option.	El: 45%	168,5	39.3
CHP electricity - solid	Over time, the scale of CHP systems shows an increasing trend, with apparent advantages from higher electrical efficiencies and lower costs. This is also combined with a developing biomass market, allowing for more competitive and longer distance supplies of biomass resources (especially forest residues). Various technical concepts have been developed and this	El: 27% Heat: 55%	2000	

	led to complex boiler concepts, e.g. involving two-stage combustion, but also new pre-treatment techniques such as straw washing. Austria, a leading country in deploying biomass fired CHP focuses on smaller scale systems on village level, generally combined with local fuel supply systems. Such countries have colder climates making CHP economically attractive. Furthermore, involvement of local communities has proven important. Municipalities and forest owners are often the owners of the CHP-plants. Energy costs of those systems are usually somewhat higher. Local societal support is generally strong though, especially due to the employment and expenditures that benefit the local community.			30
Waste digestion CHP	Anaerobic digestion of biomass has been demonstrated and applied commercially with success in a multitude of situations and for a variety of feedstocks such as organic domestic waste, organic industrial wastes, manure, sludge, etc. It is particularly suited for wet biomass materials, and biomass to gas conversion can reach some 38% strongly depending on the feedstock. Digestion has been deployed for a long time in the food and beverage industry to process waste water with high loads of organic matter. Currently, advanced, large scale, systems for wet industrial waste streams are applied in many countries and co-digestion of for example manure and wet organic process residues is particularly successful at present.	El: 38% Heat: 45%	775	40
Biogas digestion CHP		El: 38% Heat: 45%	775	50
heat, woodchips boiler	A classic application of biomass combustion is heat production for domestic applications. Technology development has led to the application of strongly improved heating systems, which can be automated, have catalytic gas cleaning and make use of standardized fuel (such as pellets). Advanced domestic heaters can obtain efficiencies of 70–85% with strongly reduced emissions. The application of such systems is widespread in Scandinavia, Austria, Germany, etc.	Heat: 85%	687	21
heat, pelletsboiler		Heat: 85%	860	26

However, at this point it should be stressed that despite the favorable fore-mentioned potentials a market for biomass energy (both agricultural and wood biomass) in Serbia can only really develop if both (i) demand is created and (ii) if biomass projects offer investors a good rate of return and can be seen to be succeeding.
The selected projects will prove to the market actors (including investors) that biomass to electricity plants are viable business opportunities and also show how the technical and financial challenges can be overcome in order to replicate identical or similar plants in the future in Serbia. Finally, they will also help "break" the classic "chicken and egg conundrum" where biomass fuel supplies do not develop until there is demand and vice versa.
Both the biogas and woody biomass technologies at the foreseen scales are fully commercial, the scales of application are small and their security of supply can be safeguarded with local supply agreements, which will further facilitate the development of biomass supply companies who will enter into long-term biomass supply contracts.
New legislation which provides a high guaranteed feed in tariff for biomass projects (see Table 2 below) is a good start but it is not enough on its own. Adoption of specific by –laws relevant to bio-energy are crucial for project implementation, compliance with international standards (both for feed-stocks and conversion equipment) as well as the provision of a sustainable financing mechanism which will be able to facilitate future support for a larger number of projects and create a biomass industry which can function without any need for technical assistance.

Table 2: Feed-in tariffs in Serbia

Power Plant type	**P - Installed Power (MW)**	**Feed-in tariff (c€/kWh)**

Biomass power plant		
	$P \leq 1$	13.26
	$1 < P \leq 10$	13.82 – 0.56*P
	$10 < P$	8.22
Biogas power plant		
	$P \leq 0.2$	15.66
	$0.2 < P \leq 1$	16.498 – 4.188*P
	$P > 1$	12.31
Biogas power plants - from animal waste		12.31

The project will complement the Government activities to promote the use of biomass as an energy source in Serbia, by combining:

A. A technical assistance package which includes building the institutional capacity required to address the legal and institutional barriers as well as creating awareness among all relevant stakeholders from the industry, government and financing sectors. A Biomass Support Unit (BSU) will be established in the Ministry of Energy & Environmental Protection (MEDEP) –on the approval of the GEF project- with the objective to facilitate the investments on agricultural and forest biomass energy projects, which due to various legal, institutional and financial barriers cannot attract enough financial resources from other sources. The GEF funds will only be used for technical assistance while the establishment and operationalization of the BSU involves co-financing from the Ministries and the national institutions involved in the project. The BSU will also include permanent members from i) the other two relevant ministries (Ministry of Agriculture and Ministry of Natural Resources) and ii) external project partners from different institutions relevant for the project (EBRD, Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency). A number of seminars and workshops will be organized by the BSU, the Chamber of Commerce and the Standing Conference of Towns and Municipalities in the duration of the project. The target groups will be governmental representatives and public sector administrators, industry and stakeholders from the financing sector.

B. An Investment Support Mechanism (combining the GEF grants with EBRD loans) to leverage other sources of financing, and to reduce the risk and to support the learning costs of the first projects. A FiT is already in place in Serbia but as elaborated during the PPG phase, a key challenge of FiTs is that the tariffs are only received once the asset starts delivering electricity, i.e. all investment has to be made by the developer upfront. This is also the case with tradable renewable energy credits, which have to be combined with effective mandates and a functioning multi-actor market, which is not feasible at this point of time in the Serbian context. Both favourable grid access and RE mandates are policies that support RE deployment without directly providing financial support, which is why they do not fit the requirements of RE developers in Serbia at this stage – they definitely need direct cash support in the start-up phase of the projects.

The leasing mechanism does remove all up-front costs for the project developers as lessees, but it does place the burden of the full investment solely on the government as owner and lessor of the asset.
Grants are much preferred by the investors as they would not have to pay them back but their main drawback is that the grant money are limited and once they finish there is no further sustainable investment development.
Following several consultations during the PPG phase with the government and the other financial institutions in the country (IFC, kfW, EBRD) the option that was favoured as the most sustainable, already successfully implemented in the region and transparent was the one of combining the GEF grant funds with a direct lending facility.

The performance based grant option is considered to have the following strengths:

- Grant funds help address the equity gap that exists in Serbia i.e. the fact that there is a lack of investors and those that are active have very high costs of equity.

- The structure of the grant, with the major portion of grant retained until a project is completed, provides better likelihood that grants are paid for successful projects. The retained 70% grant will act as a major incentive for developers to construct and commission projects. The developer will require loans from EBRD and / or other sources. This lender (or lenders) will also conduct due diligence on the project and will maintain strong pressure on the developer achieving successful outcome.
- Performance based grants can be controlled by agencies such as UNDP and therefore such a scheme will be robust against potential changes in the political landscape in Serbia.
- Grants provide support to both electricity and heat (unlike FiT which supports only electricity) and so will be well-suited to the biomass sector.
- In the event that several grant-supported projects are successfully built and operated, this will de-risk future projects, so other investors will be attracted to the sector. In other words, there is an exit strategy for the scheme.

Given this panorama and these insights, the collaboration of UNDP/ GEF and EBRD will ensure an efficient investment mechanism with transparent tendering process and minimal additional administrative burden, while giving project developers financial support in the start-up phase of the project.

The BSU will also facilitate the implementation of the Investment Support Mechanism (1.6 million dollars from GEF) while EBRD will complement existing financial resources, with the ability to absorb significantly higher risks and lower rates of return than financial resources available in the commercial market.
Firstly the BSU will identify suitable projects for financing based on a Call for proposals. Following, the BSU will use its technical capacity and also employ technical consultants to improve the bankability of the selected projects.
Following, it would refer them to EBRD for financing. EBRD will conduct a separate evaluation of the potential projects and if it finds them eligible will structure and provide debt financing for their implementation. The projects will be subject to the regular approval process (applied by the EBRD to small projects) and will be expected to meet the rigorous standards of the EBRD about sound banking, environmental and health and safety regulations, among others.
The GEF grants will be then provided as a phased-out incentive payment which will be offered in several calls for proposals only to the projects successfully evaluated from EBRD as follows:
During the call, projects will be selected based on their technical readiness, bankability and best leveraging ratio.
They will be further referred to EBRD for possible financing. EBRD will conduct a separate evaluation of the potential projects and if it finds them eligible will structure and provide debt financing for their implementation. The projects will be subject to the regular approval process (applied by the EBRD to small projects) and will be expected to meet the rigorous standards of the EBRD about sound banking, environmental and health and safety regulations, among others. The EBRD will notify UNDP in writing when a project meets all criteria and it is approved for financing. Then, the first two scoring higher on both BSU and EBRD evaluations will get up to 20% of the capital costs as GEF grant and up to a maximum of 300,000 dollars per project.
In the subsequent calls for projects the threshold for subsidy will be gradually decreased down to 15% and finally 10% in the last round or up to a maximum of 200,000 dollars per project.

In all projects the GEF grant will be provided in two sets:
a) 30% of the grant will be provided once the project receives positive response from EBRD in order to get the debt financing.
b) the remaining 70% will be given upon project completion.
During the mid-term project evaluation, a thorough evaluation of the need for additional grant provisions will also be conducted.
In the longer term, it is expected that the GEF projects would establish a good level of understanding for the EBRD loans and this will enable the future development of bankable projects and provide a good structure to leverage other sources of financing, and to reduce the risk of projects not being commercially viable or able to attract debt finance.
During the project lifetime BSU and UNDP will also work closely with the Serbian government on the operationalization of public grant scheme for biomass (e.g. within the Environmental and Energy Efficiency

Funds, etc.). This work will also be part of the capacity building that will take place in Outcome 2 and individual consultations timed according to the Serbian government needs for consultation throughout the project duration. More information on this analysis can be found in Annex 8.5 of Project Document.

The project strategy is built around five outcomes, as follows:

Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia

A significant barrier in Serbia is a lack of awareness on the opportunities available for biomass energy. Local entrepreneurs and municipalities who might implement projects need to have a greater understanding of the specific opportunities and the risks involved. This project component will be designed to address this type of barrier.
This outcome will focus on successfully launching activities that will improve the capability of both governmental/ institutional bodies, municipalities and local entrepreneurs to identify, prioritize and develop biomass investment opportunities.

Output 1.1: Biomass Support Unit Established and Operational with Team in Place to Support Biomass Projects in Serbia

- *Activity 1.1.1: Develop and agree ToR for Biomass Support Unit (BSU)*
- *Activity 1.1.2: Prepare ToR for all staff positions*
- *Activity 1.1.3: Hire all Biomass Support Unit Staff including Head of Unit/Project manager*
- *Activity 1.1.4: Hire international Chief Technical Advisor (part-time) to support the work of BSU*

Output 1.2 Designed and Implemented Training Modules on Biomass Energy for local municipalities and entrepreneurs based upon the UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants

- *Activity 1.2.1: Develop training module based upon UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants*
- *Activity 1.2.2 Training Courses successfully delivered based on the UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants by the Biomass Support Unit*
- *Activity 1.2.3: Gap analysis on the issues that arose during initial trainings on UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants (based on feedback from initial trainings)*
- *Activity 1.2.4: Updating of the Municipal Biomass Guide and Guide for Investors in Biomass Plants by end of the Project*

Output 1.3 At least 16 completed regional seminars on biomass energy that employed the designed training module and the UNDP Municipal Biomass Guide and Guide for Investors in Biomass Plants will be presented (both demand side and supply side)

- *Activity 1.3.1: Implement the 10 Training Modules on Biomass Energy for local municipalities and entrepreneurs in at least 16 regional seminars*

Output 1.4: Completed studies on biomass and preparation of "Serbian Biomass Atlas'

- *Activity 1.4.1: Review existing studies and perform gap analysis on the issues that still require investigation*
- *Activity 1.4.2: Define and adopt methodology for biomass potentials estimation*
- *Activity 1.4.3 Define and adopt methodology for biomass consumption estimation*
- *Activity 1.4.4: Continuation of studies on "The Potential of Biomass Projects in Serbia" with a focus on biomass and energy crops from agricultural and improving (as required) the study on wood waste potential for biomass*

- *Activity 1.4.5 : Preparation of Serbian Biomass Atlas (including both production and consumption data), a one stop shop for all information concerning biomass energy*

Output 1.5: Incorporated new course on Biomass Energy at the University of Belgrade & Novi Sad

- *Activity 1.5.1: Design new course (annual weekly course module incl. international expert lectures)*
- *Activity 1.5.3 Provide funding for two top international biomass experts to serve as lecturers to deliver the courses at University of Belgrade and University of Novi Sad*
- *Activity 1.5.2: Implement new course in the two Universities*

Output 1.6: Completed national public awareness raising campaign on Biomass Energy run by the Biomass Support Unit

- *Activity 1.6.1: Design and implement a national public awareness campaign*
- *Activity 1.6.2: Incorporation of Biomass awareness Raising Activities into the activities of the Standing Conference on Towns and Municipalities with a particular focus on supply-side activities*

Output 1.7: Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia prepared by the Biomass Support Unit

- *Activity 1.7.1: Organization of International Biomass Conference in Serbia in partnership with other key stakeholders*
- *Activity 1.7.2 Organization and conduct of study Tours to Biomass Projects in other countries in the region for selected municipalities*

Output 1.8 E-trade platform

- *Activity 1.8.1: Specialized web portal to enable e-trading with biomass and facilitate local and regional trading, as well as export of the locally produced biomass.*

Output 1.9: Project Website

- *Activity 1.9.1: Development and Updating of Project Website including relevant information such as Municipal Biomass Guide and Serbian Biomass Atlas (and E-trade platform)*

Outcome 2: Stronger and more effective secondary legislation related to biomass energy is developed, approved and implemented

Another significant barrier to the development of biomass projects in Serbia is the lack of secondary legislation and lack of technical standards for biomass projects. The purpose of this outcome is to improve and update the legal, regulatory and support framework in the biomass sector, e.g. by correcting targets, improving support schemes or licensing procedures, improving standardisation and regulations, etc.

Output 2.1: Adopted and implemented technical standards and regulations for biomass energy projects in line with international best practices

- *Activity 2.1.1: Review of international best practices on technical standards related to biomass and identification of most relevant ones for adoption in Serbia*
- *Activity 2.1.2: Supporting development, adoption and implementation of technical standards and regulations for biomass projects, including required amendments to existing standards and regulations for energy/power facilities.*

Output 2.2: Policies and regulations to promote biomass supply and its sustainability adopted and implemented

- *Activity 2.2.1: Supporting development, adoption and implementation of biomass sustainability criteria considering a range of issues such as sustainable harvesting rates, biodiversity protection and land use rights for local population. Only projects and facilities meeting the established criteria would qualify for investment support scheme and any other form of public support*
- *Activity 2.2.2: Supporting development, adoption and implementation of policies and regulations promoting and enhancing bioenergy production by farmers (such as bioenergy crops production, collection and handling of agricultural residues), including, inter-alia, via amendments to the existing agricultural policies and rural development programmes.*

Output 2.3: Appropriate licensing procedures developed and in place to support the long-term development of the biomass market in Serbia

- *Activity 2.3.1: Develop the Business Plan of a one stop shop for bioenergy investments*
- *Activity 2.3.2: Development improved licensing procedures for long term biomass supply, bioenergy and biofuel plants to support market development*

Outcome 3: Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects

Currently, there is a lack of detailed and high quality information available on potential biomass project opportunities which are sufficient to attract investment capital. Project developers typically need to invest high-risk early seed capital into new project ideas, and in the case of biomass projects, there is a lack of willingness to do so.
A Biomass Support Unit (hereafter referred to as the BSU) will be established within the Ministry of Energy, Development and Environmental Protection (MEDEP) with the objective to facilitate the investments on agricultural and wood biomass energy projects, which due to various financial barriers cannot attract enough financial resources from other sources. The BSU will use the Investment Support mechanism to complement existing financial resources, with the ability to absorb significantly higher risks and lower rates of return than financial resources available in the commercial market. GEF funding will be used to help launch the BSU and for BSU activities but the ongoing running and operating costs of the BSU will be paid for by the MEDEP as part of its co-financing commitment to the project.

The BSU will also include permanent members from i) the other two relevant ministries (Ministry of Agriculture, Forestry and Water Management and Ministry of Natural Resources, Mining and Spatial Planning) and ii) external project partners from different institutions relevant for the project (EBRD, Serbian Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency Srem).

The UNDP Serbia will provide support to the MEDEP and BSU as needed during the project implementation. Specifically, support will be provided in the following areas: assistance in the project launching, potential participation in the Project Board meetings, monitoring the implementation of the work plan and timetable, field visits and preparing and circulating reports after the visit, project documentation revision, reviewing, editing and responding to the project reports, technical backstopping, support to the policy negotiations, financial management and accountability, advising and consulting during the audit process, preparation of budget revisions, financial completion activities, direct payments, advance payments, other support services as networking and exchange of best practices, preparation of the Annual Project Reports, Project Implementation Reports, and arranging the independent evaluations.

This Outcome will help to overcome these barriers by providing support for the National Programme for Supporting Biomass and by establishing criteria for the support of selected projects. The expected outcome from the outputs that will be delivered from the completion of the envisioned activities under this component is increased capability of municipalities and local entrepreneurs to develop bankable biomass energy projects.

Output 3.1: Developed and adopted National Programme for Supporting Biomass Projects

- *Activity 3.1.1: Develop National Biomass Programme (five year plan)*
- *Activity 3.1.2: Provide expert assistance to the selected project developers including assessment of CDM potential and carbon finance and support for preparation of CDM documentation*
- *Action 3.1.3: Develop a Biomass Resource Efficiency Strategy and Roadmap to exploit the biomass feedstocks for energy, fuels and other industrial applications.*

Output 3.2: At least 20 completed training seminars by the Biomass Support Unit (with EBRD) for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the Investment Support Mechanism

- Activity 3.2.1: Work with existing banks, financing programs, and facilities in Serbia to improve their understanding of renewable/biomass energy projects
- Activity 3.2.2: Use the technical assistance funding as a tool to secure financing for the best demonstration projects and project ideas by ensuring that technical assistance funds are targeted at those projects with highest chances of success

Outcome 4: A minimum of six biomass projects are successfully financed, constructed and operating by the end of the project

Serbia ratified the Kyoto Protocol in September 2007, making it the last country in Europe to do so. While Serbia is not an Annex I Party to the Protocol meaning that it has no legally binding cap to meet during the first commitment period of the Protocol (2008-12), ratification is important because it means that the Serbian Government is increasingly committed to undertaking actions to reduce greenhouse gas emissions in a cost-effective manner. As a potential candidate to join the European Union in future, the government of Serbia accepts that stronger actions and measures are going to be required to reduce missions.
As established in the "Situation Analysis" section, there is good biomass feedstock potential in Serbia. However, without considering their broader social and economic benefits, biomass energy projects are still at the borderline of being economically feasible and most of them require additional support. The level of this support will depend largely on the mechanisms through which this support is provided. Direct investment subsidies can make projects economically attractive, but they quickly exhaust limited government and other resources for project support. By leveraging limited subsidies with other types of risk mitigation, funds can be spread across more projects and used more cost-effectively.

It has been characteristic for biomass projects in Serbia that even with the currently available feed-in tariffs, combined with available financing at favourable interest rates, the projects have been unable to secure financing. Municipalities or other local investors are unable to raise the necessary equity (i.e – there is an equity gap) for the projects up front, or the risks associated with construction and the first several years of operation have been considered too high. These problems could be overcome by increasing the share of the grants in biomass investment projects in order to reduce the equity required from investors and/or to increase the rate of the return to a level that would reflect project risk.

Encouraging additional investment in biomass projects requires flagship projects with high replication potential which give confidence to investors that such projects are commercially viable and are proven to work. This is the expected outcome from the anticipated outputs of the envisioned activities that will be carried out under Component 4. The two main types of biomass projects which have potential for large scale deployment in

Serbia include agricultural waste (incl. livestock) biomass projects and wood-waste biomass projects. Therefore component 4 of the project will involve providing investment grants to a minimum of six biomass projects (3 wood biomass and 3 agricultural biomass) and providing them each with GEF investment grants (in a phased out form) of up to US $300,000 each on the basis that the GEF cost is no more than 20% of the total project investment cost meaning that each selected project should be at least us$1.6 million dollars or more in total costs. The selection of at least four projects will be based in the collaboration of UNDP with EBRD. During the PPG phase, six projects (4 biogas and 2 wood CHP ones, totaling 6.9 MWe) expressed interest to join the GEF project. The final project selection/ configuration will be subject to technical assistance and final approval through the EBRD process. To ensure institutional sustainability, the Biomass Support Unit, will be responsible for the management of the Investment Support Mechanism. The selected projects (six or more) will help to create a market demand for biomass in Serbia.

Output 4.1 Investment Support Mechanism

The project will facilitate establishment and implementation of the Investment Support Scheme for biomass projects in partnership with EBRD, whereby GEF resources will be used to provide performance-based subsidies to the first batch of commercial biomass projects in Serbia. The scheme will be designed and implemented in stages aiming at gradual phase-out of subsidy provision and maximizing its leveraging potential, as follows:

- Stage 1. Subsidy covers up to 20% of capital costs leveraging at least 3 mln US$ against GEF investment of 0.6 mln US$ (1:5)
- Stage 2. Subsidy covers up to 15% of capital costs leveraging at least 4 mln US$ against GEF investment of 0.6 mln US$ (1:7)
- Stage 3. Subsidy covers up to 10% of capital costs leveraging at least 4 mln US$ against GEF investment of 0.4 mln US$ (1:10)

	Max share of GEF grant	Max value of GEF grant, $	Total Project Cost	Leveraging ratio
Phase I	20%	600,000	3,000,000	5
Phase II	15%	600,000	4,000,000	7
Phase III	10%	400,000	4,000,000	10
Total	15%	1,600,000	11,000,000	7

The Investment Support Mechanism will be designed to ensure its sustainability beyond project duration, as follows:

1) Strengthened performance-based nature of grant provision in order to maximize success of demonstration projects and thus contribute to elimination of principal barrier, which is the absence of successful commercially run biomass projects which deter investment and increase risks for developers.

Performance-based financing principles will be incorporated in the grant provision scheme as follows:
- 30% of grant amount will be provided after approval of EBRD loan financing and thus only for those projects which meet EBRD due diligence requirements for lending;
- 70% of grant amount will be allocated after project construction and commissioning, which is a clear incentive for and criteria of a success.

2) Phased approach to implementation of Investment Support Mechanism will be adopted to gradually reduce the amount and share of subsidies in the project financial structure (see also response to question 14 above). This will allow testing project assumptions about underlying risks (i.e. market perception and lack of investors' confidence), as well as the impact of the project on reducing them. Two independent

evaluation of the project and the Investment Support Mechanism will be conducted, at mid-point and by the end of the project to re-assess market situation, investors' perception and the remaining needs, if any, for additional support scheme and subsidy provisions beyond the duration of the project and GEF budget.

3) Continuous dialogue and partnership with EBRD and other financiers will be pursued to inform them, using demo-projects as examples, about risk-reward profile of biomass investment with a view of gradually reducing financier's requirements for high equity share in such project types and thus reducing the need for direct grant support.

4) Based on the finding of project mid-term and final evaluation, the project will provide assistance to the Government of Serbia with establishing public funding window for biomass projects under its Environment and Energy Efficiency Fund. The nature of public support will be determined based on the results of Investment Support Mechanism evaluation and might include either only project preparation support to facilitate identification and development of biomass project pipeline or also continuation of direct grant subsidies, should the market conditions dictate further need and demand for such scheme.

- *Activity 4.1.1 Structure and timeframe for implementation of Investment Support Mechanism developed and agreed upon*
- *Activity 4.1.2 Tendering and evaluation process*
- *Activity 4.1.3 Provision of investment support to four biomass projects*
- *Activity 4.1.4 Assistance to the Government of Serbia with establishing, securing financing for and implementation of the public funding scheme for biomass projects under the State Environment and Energy Efficiency Fund.*

Output 4.2 Agricultural Biomass projects are selected under the Investment Support Mechanism and are developed, constructed and operational by the end of the project

- *Activity 4.2.1 Selection of projects through tendering procedure*
- *Activity 4.2.2 Monitoring project development*
- *Activity 4.2.3 Best Practice guidelines for the implementation of the similar type projects*

Output 4.3: Wood Biomass projects are selected under the Investment Support Mechanism and are developed, constructed, and operational by the end of the project.

- *Activity 4.3.1: Selection of projects through tendering procedure*
- *Activity 4.3.2: Monitoring project development*
- *Activity 4.3.3: Best Practice guidelines for the implementation of the similar type projects*

Outcome 5: At least 12 additional Biomass Projects are being supported by the Biomass Support Unit / Investment Support Mechanism by the end of the Project

It is important that the project has sustainable results throughout Serbia in order that a more widespread promotion of biomass energy can be undertaken and that there is ongoing support. For this to happen the Biomass Support unit needs to be providing ongoing assistance to additional biomass projects in Serbia beyond only those projects which are selected and partially supported by this project. The goal of the project will be that at least 12 additional projects are successfully being supported by the Biomass Support unit through technical assistance - $5,000 per project for business plans/feasibility studies by the end of this project. The financial assistance for these additional projects will not come from the GEF. The collaboration with EBRD will improve the knowledge base among investors, reduce barriers and facilitate the future financing of biomass projects in Serbia.

Output 5.1 Twelve 12 additional Biomass Projects in Serbia are successfully supported beyond those which are partially assisted with GEF funds

- *Activity 5.1.1: Selection of projects through tendering procedure*
- *Activity 5.1.2: Monitoring project development*
- *Activity 5.1.3: Best Practice guidelines for the implementation of the similar type projects*

Output 5.2 Produced documentary film on the implemented Biomass Energy pilot projects produced by the Biomass Support Unit

- *Activity 5.2.1 Development of short-film on Biomass Energy based on investment in biomass pilot projects in Serbia*
- *Activity 5.2.2 Short Case Studies produced from the Demonstration Projects*

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Under the business-as-usual (BAU) scenario with no GEF involvement, it is reasonable to assume that the biomass market for electricity in Serbia would be characterized by the following features:

- The deployment of biomass energy would continue at a very slow rate in Serbia due to the large number of barriers clearly articulated in the Biomass Action Plan and in this document.
- The majority of electricity generation in Serbia will continue to be based on natural gas and fossil fuels, putting extra pressure on national budget for import prices and keep high levels of environmental pollution.
- Considerable potential for biomass electricity will remain unexploited. The technically exploitable potential of biogas is approximately 7 PJ. The installed capacity could be 102 MWe. On the other hand, forest residues in Serbia are left over at the logging sites and are estimated at 2.8 PJ. It is assumed that ~50% of this potential could be exploited for small to medium scale CHP plants. The installed capacity could be 19 MWe.

GEF assistance is therefore requested to help overcome the main barriers which include the lack of capacity to develop bankable biomass projects and lack of ability to finance those projects on commercially attractive terms as well as lack of coherent datasets and awareness for the biomass opportunities in Serbia.

In the baseline situation the biomass electricity sector will be almost stagnant to the 4MWe currently on the ground. A set of consultations with project developers/ owners has clearly indicated that they face difficulties in:

- Clarity of licensing and permitting procedures.
- Lack of secondary legislation which prohibits grid connection.
- The option to feed biogas into the natural gas grid is mentioned by the Law on Pipeline Transport of Gaseous and Liquid Hydrocarbons. However, by-laws to practically regulate this matter are not yet drafted so injection of biogas into the grid is not practically possible at present.
- Lack of equity which prohibits them meeting the high upfront investment costs of biomass electricity plants.
- Commercial lending rates available on the Serbian market are also prohibiting.

In the baseline situation, awareness barriers will remain as there are no concrete coordinated actions to tackle the following issues:

- Cross ministerial and institutional collaboration required to build the capacity for legislation development, , compliance with certification, standardization and sustainability rules.
- Low familiarity of biomass merits among stakeholders when compared to the number of engineers and experts who have expertise in the energy sector in relation to fossil fuel energy generation projects.

- Lack of knowledge about the options for biomass exploitation would remain a limiting factor to the future development of the sector, taking into account that the diversity and complexity of biomass technologies available in the market could increase uncertainty and confusion among investors.
- Local knowledge and experience on operation and maintenance of biomass power plants would develop at a very slow rate.
- Biomass trade/supply would develop slowly because of lack of an appropriate trade platform, long-term supply contracts and information on biomass prices.

In the baseline situation, data and awareness barriers will remain. In particular the most important ones would be:
- Scarcity, fragmentation and unreliability of data on the availability, typology and geographical distribution of various biomass resources which significantly constrains potential private sector interest in developing biomass energy projects and assessment of their technical and financial feasibility.
- Fragmentation and unreliability of data on the biomass consumption which hinders the development of concrete and realistic targets and creates difficulties in the international reporting for biomass consumption for energy use.
- Municipalities wouldn't be aware for the different options of biomass technologies, which would lead to a more cautious approach and delays in licensing procedures.

In the baseline situation, legal and regulatory barriers will remain in the following key areas:
- Lack of adoption of appropriate by-laws will prohibit bio-electricity integration in the Serbian energy market.
- Unsustainable support schemes and complicated licensing procedures will continue prohibiting investments.
- Lack of harmonization of the respective standards and regulations according to the European requirements will cause difficulties in future market development. There will be a significant number of different appliances for biomass energy exploitation, available at the Serbian market, which are not tested/ certified according to appropriate technical standards and development of corresponding laboratories for testing/certification would be very slow.

In the baseline situation, financing mechanisms will find it difficult to support biomass projects due to the lack of equity available and there will be a serious lack of investment in biomass to energy facilities by private sector investors due to the aforementioned high risks and barriers. Bio-energy projects would be limited to small-scale one-off initiatives pursued by risk-taker entrepreneurs. These small-scale initiatives are less likely to proceed than those carried out by well capitalized companies.

GEF assistance is requested to help overcome the barriers outlined above, which currently prevent efficient production and utilization of biomass energy for electricity generation in Serbia - thereby helping to move the domestic electricity market towards an alternative path. The GEF alternative scenario relies on a set of actions and expected outputs, as described in the Project Document, in order to create an enabling environment for wider exploitation of biomass, as a substitute to the currently used fossil fuels, to meet the energy sector's needs in a sustainable and efficient way, thereby reducing dependence on fossil fuels and limit GHG emissions in Serbia.

With the GEF support as part of this project and ensuring replications, the following impacts are expected to be effected by 2025:
- Biomass electricity generation is expected to grow at a faster pace than that of the BAU scenario, reaching up to 60 MWe of power (51 MWe biogas and 9 MWe wood- CHP) which represents 50% of the biogas and forest residues potential for this sector;
- At least six biomass plants will be built during the project phase (3 agricultural and 3 woody biomass CHP ones);
- Additional 12 biomass plants will be successfully supported by the BSU beyond those which will be partially assisted with GEF funds;
- Each US$1 of GEF money spent will have leveraged at least US$7 in private and public investment into biomass production and utilization in Serbia based on the requirement that not more than 20% of each projects total capital cost comes from GEF;

A number of the aforementioned barriers which currently prevent the development of the biomass market and use of bio-energy will be addressed and removed in course of the project. This will enable additional private and/or public investments into forest biomass and biogas electricity plants across Serbia enable efficient uptake of the high untapped biomass potentials to produce at least 60 MWe of power (51 MWe biogas and 9 MWe wood-CHP).
During the lifetime of the project it is estimated that this project will lead to direct emission reductions of 1,247,481 tCO2e associated with the demonstration projects The combined impacts of the project-supported interventions and ensuring replications within 10 years of the GEF project influence period are estimated to enable cumulative GHG emission reductions of 397.711 MtCO2e (over 20 years of investment lifetime), assuming GEF causality factor of 60%.

The calculations follow the "GEF Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects". Key assumptions for the estimation of direct emissions reductions achieved by 4 agricultural and 2 wood small to medium projects over its duration of 4 years (total 6.9 MWe biomass electricity/ CHP projects) are the Serbian baseline CO2 emission factors for grid electricity (0.945 tCO2e/MWh) and heat (0.32 tCO2e/MWh), 20 year asset lifetime and the estimated annual energy production of the planned projects. Indirect emission reductions were calculated both bottom-up and top-down methodology.
In the bottom-up methodology a replication factor of 3 was assumed.
In top-down methodology, the assumptions were 20 MWe for biogas and 5 MWe for wood CHP for the 20-year technological/economic potential, and a GEF causality factor of 60%.
Summary of GHG reductions:
Direct: 1,247,481 tCO2e
Indirect BU: 3.742 MtCO2e
Indirect TD: 397.711MtCO2e

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

The following risks have been identified:

Risk Described	Risk Level	Risk Explanation and Mitigation Strategy
Climate Change	Medium	The project will ensure application of the EU Guidance on integrating climate change and biodiversity in the Environmental Impact Assessment (see below) when conducting EIA for the investment proposals by making adequate emphasis on the following provisions: - Selection of relevant climate change scenarios for biomass sector and identification of relevant climate change adaptation concerns for the sector, such as the impact of changing climate on biomass availability; - Identification of critical interdependencies, such as water-energy-biomass linkages and the impact of climate change on the individual components within the system; - Review of projects risk management plans and ensuring incorporation of measures to address identified climate risks and adaptation needs. The project involves biomass and so in general there is the potential of climate change impacts, both socially and environmentally. However, both the selection and the monitoring processes will ensure that high standards are applied and compliance with European and international regulations for emissions, effluents, etc., is secured. In detail, the impacts will primarily be evident in the upstream in two issues: a) forest harvesting/ handling for the forest biomass projects that will be supported. The evaluation, approval and monitoring procedures will be tailored accordingly and an Environmental Impact Assessment will be included in the investment proposals to ensure these potentially negative impacts are managed with current best practices. b) collection/ storage/ handling of the manure for biogas production. The evaluation, approval and monitoring procedures will be tailored accordingly and an Environmental Impact Assessment will be included in the investment proposals to ensure these potentially negative impacts are managed with current best practices. Also, the project will encourage real investments, physical interventions, with the implementation of at least six biomass to electricity plants, so again, that provides potential for negative impacts. For the downstream the following two issues are considered more relevant for the project: a) the combustion of biomass will be made with efficient equipment that will include all the necessary filters and

		environmental technologies to minimize emissions. The disposal of the generated ash will also be made according to international practices and the selected projects will be asked to ensure the appropriate supply chains for this process. b) in the case of biogas, the de-gased manure will be used as fertiliser and the selected projects will be asked to ensure the appropriate supply chains for this process. c) Again, as in the upstream, the evaluation, approval and monitoring procedures will be tailored accordingly and an Environmental Impact Assessment will be included in the investment proposals to ensure these potentially negative impacts are managed with current best practices. d) On the other hand it should be stated that the project will create significant opportunities for the local communities and more specifically the following: • Serbian communities through the creation of new jobs and provision of renewable energy to their population; • Local farmers and forest owners through creating the market for wood fuel collected from forest thinning and cleaning, and from increased use of agricultural residues; • Local project developers interested to develop , build , and successfully operate biomass projects in Serbia • Local consultant companies and NGOs providing expertise and services to promote and implement biomass energy activities; and • Local firms producing wood biomass boilers and related equipment (secondary beneficiary)
Supply Risks	Medium	Difficulty of securing long-term supply. Project will work to reduce this risk by developing model supply agreements and by supporting policies and regulations enhancing domestic c production of bioenergy (under Component 2).
Poor cooperation between government stakeholders	Medium	The project will follow a highly participatory approach as it will consult and actively involve all the relevant government stakeholders. The decision to appoint Ministry of Energy, Development and Environmental Protection as the lead agency for this project and for the establishment of the Biomass Support unit and the direct involvement of the other two related Ministries, i.e. Agriculture, Forestry and Water Management and Natural Protection Resources, Mining and Spatial Planning is expected to facilitate the communication and efficient transfer of knowledge. Consideration is also given to the active involvement (through capacity building, training and technical contribution to standards and regulations) of key external project partners from different institutions relevant to the project (EBRD, Serbian Chamber of Commerce, Standing Conference of Towns and Municipalities, Institute for Standardization and Regional Development Agency Srem).
Inadequate project implementation	Medium	Careful selection of project team members and the Biomass Support Unit staff to be put in place is required. The project design aims to

		minimise institutional bureaucracy through the careful division of activities between government, municipalities, NGOs and the private sector.
Lack of ongoing, long term political and government support for improved biomass energy sector in Serbia	Low	The Government commitment to promoting renewable energy is confirmed by the 2011 Energy Law and the new FiTs adopted on January 2013. New legislation and new policies need to be backed up by real projects which demonstrate that the new policies are indeed working. Hence, we do not expect this to be a major risk. Continuous engagement with the Government over the lifetime of this project will help to reduce this risk.
Use of inappropriate biomass technologies for projects	Low	Only biomass technologies with a proven track record in other countries will be selected for the projects, and a thorough analysis of the entire value-chain economics

A.7. Coordination with other relevant GEF financed initiatives

No coordination with current GEF financed activities in the countries is foreseen. This will be revisited in the beginning of the GEF project to ensure the appropriate collaborations.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

A Public Awareness Strategy has been prepared during the PPG phase. This strategy has the following key audience groups within Serbia:

- private or public businesses interested in becoming part of the biomass sector, whether on the operational, supply
- chain, feedstock or investment side;
- institutional investors, be it domestic or international;
- public bodies which have a role in enabling and facilitating investment at local, regional or central government
- level, by, for instance, grants of land or premises, or by entering into private-public partnerships;
- regional development agencies;
- business stakeholders, such as trade bodies and associations;
- government stakeholders;
- environmental organizations and environmental NGOs;
- individuals with an academic interest in biomass;
- business journalists and 'pundits';
- audience interested in wider renewable energy issues;
- general audience with some interest in these issues.

The aim of this strategy is to increase awareness of the opportunities and benefits in developing the Serbian biomass sector. In order to carry out the strategy the narrative has been set out and discussed with the key identified audiences during the PPG phase and then a series of modules which deliver strategic objectives (marked as 'outputs') have been prepared. The advantage of a modularized programme of activity is that it allows closer budgeting and monitoring of deliverables. The following modules will be considered:

- Module 1: attitudes and knowledge survey
- Module 2: database (directory) building exercise
- Module 3: monthly e-mail update
- Module 4: Quarterly bulletin – information sheet
- Module 4: Serbian biomass web-site
- Module 5: Print media campaign
- Module 6: Broadcast media campaign
- Module 7: video presentations
- Module 8: technology ambassadors
- Module 9: technology road-show events
- Module 10: Biomass Day/celebrating success

Carried out in part or as a whole this strategy should be able to deliver a quantifiable positive shift in public awareness about the biomass sector in Serbia.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

Biomass production for electricity provides the following benefits:

- Businesses - stable long term upstream and downstream business with good returns
- Local – jobs, taxes, investments in poorer rural infrastructure, sustainable agriculture
- National – improved energy security and balance of payments
- Climate – large cuts in CO2 emissions along the entire value chain

Gender dimensions will be appropriately addressed by the project. Within the project context this means that women will be encouraged to participate in policy development but also in activities that will be implemented at the local level related to educational and raising awareness activities on biomass energy. Another crucial aspect will be to support equally women for developing business plans and development of agriculture biomass/energy crops cooperatives, which is natural home for women entrepreneurs.

B.3.Explain how cost-effectiveness is reflected in the project design:

Serbia ratified the Kyoto Protocol in September 2007, making it the last country in Europe to do so. While Serbia is not an Annex I Party to the Protocol meaning that it has no legally binding cap to meet during the first commitment period of the Protocol (2008-12), ratification is important because it means that the Serbian Government is increasingly committed to undertaking actions to reduce greenhouse gas emissions in a cost-effective manner. As a potential candidate to join the European Union in future, the government of Serbia accepts that stronger actions and measures are going to be required to reduce missions.

As established in the "Situation Analysis" section, there is good biomass feedstock potential in Serbia. However, without considering their broader social and economic benefits, biomass energy projects are still at the borderline of being economically feasible and most of them require additional support. The level of this support will depend largely on the mechanisms through which this support is provided. Direct investment subsidies can make projects economically attractive, but they quickly exhaust limited government and other resources for project support. By leveraging limited subsidies with other types of risk mitigation, funds can be spread across more projects and used more cost-effectively.

It has been one of the key characteristic for biomass projects in Serbia that even with the currently available feed-in tariffs, combined with available financing at favorable interest rates the projects have been unable to secure financing. Municipalities or other local investors are unable to raise the necessary equity for the projects up front, and/or the risks associated with construction and the first several years of operation have been considered too high. These problems could be overcome by introducing an appropriate financing mechanism in order to reduce the equity required from investors and/or to increase the rate of the return to a level that would reflect project risk.

Encouraging additional investment in biomass projects requires flagship ones with high replication potential which can significantly increase the confidence among investors. This is the expected outcome from the anticipated outputs of the envisioned activities that will be carried out under Component 4. Component 4 of the project will involve providing investment grants to a minimum of six biomass projects (3 wood biomass and 3 agricultural biomass) and providing them each with GEF investment grants of up to US $400,000 each on the basis that the GEF cost is no more than 20% of the total project investment cost meaning that each selected project should be at least us$1.6 million dollars of more in total costs. The selection of at least six projects will be based in the collaboration of UNDP with EBRD. During the PPG phase, six projects (4 biogas and 2 wood CHP ones, totaling 6.9 MWe) expressed interest to join the GEF project. The final project selection/ configuration will be subject to technical assistance and final approval through the EBRD process. To ensure institutional sustainability, the Biomass Support Unit, will be responsible for the management of the Investment Support Mechanism. The selected projects (four or more) will help to create a market demand for biomass in Serbia.

The BSU will also facilitate the implementation of the Investment Support Mechanism (1.6 million dollars from GEF) while EBRD will complement existing financial resources, with the ability to absorb significantly higher risks and lower rates of return than financial resources available in the commercial market.

Firstly the BSU will identify suitable projects for financing based on Calls for proposals. Following, the BSU will use its technical capacity and also employ technical consultants to improve the bankability of the selected projects.

Following, it would refer them to EBRD for financing. EBRD will conduct a separate evaluation of the potential projects and if it finds them eligible will structure and provide debt financing for their implementation. The projects will be subject to the regular approval process (applied by the EBRD to small projects) and will be expected to meet the rigorous standards of the EBRD about sound banking, environmental and health and safety regulations, among others.

The GEF grants will be then provided as a phased out incentive payment which will be offered only to the projects successfully evaluated from EBRD in two sets:
a) 30% of the grant will be provided once the project receives positive response from EBRD in order to get the debt financing.
b) remaining 70% will be given upon project completion.

Besides promoting the biomass projects, the project will also promote the increased and more efficient use of biomass in energy applications through dedicated capacity building and training actions for a variety of stakeholders from the industry, governmental and financial sectors.

C. DESCRIBE THE BUDGETED M &E PLAN:

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager ▪ UNDP CO, UNDP GEF	None	Within first two months of project start up
Measurement of Means of Verification of project results	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members ▪ Monitoring and Reporting consultant	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on *output and implementation*	▪ Oversight by Project Manager ▪ Project team	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager and team ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	To be determined by Project team and UNDP CO
Mid-term Evaluation	▪ Project manager and team ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 20,000	At the mid-point of project implementation During MTE a thorough evaluation of the need for additional grant provisions will also be conducted
Final Evaluation	▪ Project manager and team, ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 20,000	At least three months before the end of project implementation
Project Terminal Report	▪ Project manager and team ▪ UNDP CO ▪ local consultant	0	At least three months before the end of the project
Audit	▪ UNDP CO ▪ Project manager and team	Indicative cost per year: 2,500	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives		As needed
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		**US$ 50,000**	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):): (Please attach theOperational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Toni PETROVIC	GEF Operational Focal Point	MINISTRY OF ENERGY, DEVELOPMENT, AND ENVIRONMENTAL PROTECTION	25/06/2013

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	**Signature**	**Date *(Month, day, year)***	**Project Contact Person**	**Telephone**	**Email Address**
Adriana Dinu, UNDP-GEF Executive Coordinator and Director a.i.		January 10, 2014	Marina Olshanskaya Regional Technical Advisor, EITT	421 907 840 152	marina.olshanskaya@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: Focusing on environmental and natural resource management					
Country Programme Outcome Indicators: Enabling environment and status of implementation of national and international environmental commitments					
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. Mainstreaming environment and energy OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.					
Applicable GEF Strategic Objective and Program: GEF-4 Strategic Programme 4 on 'Promoting Sustainable Energy Production from Biomass'					
Applicable GEF Expected Outcomes: a. Appropriate policy, legal and regulatory frameworks adopted and enforced; b. Sustainable financing and delivery mechanisms established and operational; c. GHG emissions avoided					
Applicable GEF Outcome Indicators: a.Extent to which EE policies and regulations are adopted and enforced; b. Volume of investment mobilized; c. Tonnes of CO2 equivalent avoided					
	Indicator	**Baseline**	**Targets End of Project**	**Source of verification**	**Risks and Assumptions**
Project Goal Reduction of GHG emissions associated with electricity generation in Serbia	GHG emission reductions, achieved during project lifetime, from project-supported installation and operation of biomass	Zero	At 1,247,481 tonnes of CO2 equivalent will be achieved over the lifetime of the investments of 20 years from projects supported by the UNDP GEF project	Project monitoring system and all project reports	- Feasibility studies prove cost-effectiveness of biomass technologies in Serbian context - Required investments are forthcoming
Project Objective To reduce barriers to accelerate the development of biomass markets in Serbia	Installed capacity of incremental biomass projects, substituting fossil fuel-based heating, supported by the project	Zero	At least 3 MW of installed capacity support by this project fully operation by end of the project Direct greenhouse gas emission reductions totaling 1.2 million tonnes of CO2 equivalent will be achieved over the lifetime of the investments of 20 years	Commissioning reports Energy balance – energy generated from biomass	- Feasibility studies prove cost-effectiveness of biomass technologies in Serbian context - Required investments are forthcoming - Not attractive investment environment for investors (adoption of lower feed-in tariffs)
Outcome 1: Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop biomass investment opportunities in Serbia	Established Biomass Support Unit	No Biomass Support Unit	Biomass Support Unit staffed and in full operation with funding to continue after project ends	Commissioning report, project monitoring system	Relevant stakeholders provide sufficient level of cooperation
	Training Modules and seminars on Biomass Energy for local municipalities and entrepreneurs based upon the UNDP Municipal	No training or study courses on Biomass to Energy issues Not existing guidance in development of	At least 12 completed regional seminars on biomass energy that employed the designed training module will be presented	Number of biomass projects in advanced phase (with construction permit)	- Not attractive investment environment for investors (adoption of lower feed-in tariffs)

	Biomass Guide	biomass projects or previous experience			
	Preparation of the Serbian Biomass Atlas for production and consumption	No defined methodology for biomass potential estimation and for the estimation of biomass consumption	Defined and adopted methodologies and respective databases	Project monitoring system	- Feasibility studies prove cost-effectiveness of biomass technologies in Serbian context - Required investments are forthcoming
	New course on Biomass Energy at the University of Belgrade & Novi Sad	Currently no training or study courses on Biomass to Energy issues	Established courses on biomass at Uni Belgrade and Novi Sad	Project monitoring system Surveys and Questionnaires	No interest from the Uni's side No continuation after end of project
	Public awareness raising campaign on Biomass Energy	Limited awareness about climate change issues	Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia produced by the Biomass Support Unit	Project monitoring system Surveys and Questionnaires	Opposition to climate change Indifference against climate change
	Support material to facilitate investments • Public awareness campaign • Annual International workshop • e-trade platform	Confusion about the meaning of bankable biomass project Lack of knowledge about biomass projects among local banks	Guidelines for the preparation of bankable projects that can be financed by EBRD and other international funds	Project monitoring system Surveys and Questionnaires	No capacity from the financial side (local banks) Lack of equity prohibits further investment in the bioenergy sector
Outcome 2 Stronger and more effective secondary legislation related to biomass energy is developed and approved and adopted	Status of adoption of technical standards, policies and regulations for biomass projects and biomass supply (the exact list of regulatory documents to be developed and adopted – to be clarified at the Inception stage)	No standards or policies exist specifically for biomass projects	Proposed technical standards, policies and regulations are adopted and implementation documents by the end of the project	Report on the status of adoption and implementation on biomass policies and regulations in Serbiua	Lack of harmonized standards and regulations according to the European requirements causes difficulties in future market development. There is a significant number of different appliances for the use of biomass, available at the Serbian market, which are not tested/ certified according to appropriate technical standards and development of corresponding laboratories for testing/certification is very slow.
	Established licensing procedures	Lack of integrated licensing procedures	Appropriate licensing procedures biomass to energy systems are in place and investors have clarified and simplified process to follow	Project monitoring system Surveys and Questionnaires	Changes in European biomass legislation mainly due to sustainability issues could potentially create complications in the licensing procedures.

Outcome 3 Successfully operating Biomass Support Unit which leads to increased capability of municipalities and entrepreneurs in Serbia to develop, finance, construct, and operate bankable biomass energy projects	Availability of National Programme for bioenergy development in Serbia	No long-term National Programme for bioenergy sector in Serbia	National Bioenergy Strategy and Action Plan, which reflects broad stakeholder consensus, adopted by the Government of Serbia	Bioenergy strategy; stakeholder consultation reports Surveys and Questionnaires	Government of Serbia willing to formalize vision for bioenergy development in the country
	Number of training seminars for banks and project developers	No dedicated training	At least 20 completed training seminars by the Biomass Support Unit for Serbian banks and Serbian project developers regarding biomass to energy projects and how the Biomass Support Unit can provide assistance through the Investment Support Mechanism	Project monitoring system Surveys and Questionnaires	
	Status of Investment Grant Mechanism	NoInvestment Grant mechanism	Operational criteria agreed with relevant stakeholders and investment grants released	Project monitoring system	Co-financing partners keep their financial commitments Continuation of Grant Mechanism after project ends? Cancellation of selected project
Outcome 4: Six biomass projects are successfully financed, constructed and operating by the end of the project Technical viability of specific biomass technologies is demonstrated as the basis for replication	Investment grant mechanism	No investment grant mechanism	Investment grant mechanism established and successfully piloted by the end of the project Public support scheme for biomass projects established and is operational under the State Energy and Environment Fund by the end of the project		
		No bioenergy projects, insufficient capacities	6 biomass projects of at least 4MW installed capacity (in total) are successfully financed, constructed and operating by the end of the project	Project monitoring system	Sufficient level of interest among potential bioenergy sector participants
Outcome 5: At least 12 additional Biomass Projects are being supported by the	Number of new bioenergy projects initiated in Serbia	No bioenergy projects, insufficient capacities	At least 12 new bioenergy projects designed with financial closure reached by the end of the project	Project monitoring system	Sufficient level of interest among potential bioenergy sector participants

Biomass Support Unit / Investment Grant Mechanism by the end of the Project					Sufficient budget resources
	Case Study or Documentary film on biomass	No recent films covering full supply to delivery chains	One film covering all the projects established during the project	Project monitoring system	No risks

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Questions	**Answers**
Is the project aligned with the focal area/multi-focal area/ LDCF/SCCF results framework?	Endorsement stage updated the section A.1.1 according to the GEF5 strategic framework for CC.
An evaluation of the reasons why the existing activities have not managed to address the barriers to the development of the market should be provided.	Addressed in the Project Document
The supply chain activities of the demonstration should be clearly analyzed based on existing input, techniques, means of collection and transportation, and their costs.	The final selection of the projects will be done during the GEF project, so no concrete supply chain descriptions are included in the PPG phase.
During the project preparation please involve all the relevant ministries and authorities (not only the Ministry of Environment) in order to reach an agreement of which is the most appropriate agency to promote the use of re-newables, including biomass, and to manage relevant funding. Since Serbia is a potential candidate state for accession o the EU, it should consider a scheme that is compatible with the European experience and acquis.	All relevant Ministries involved (see LoS) and a scheme that is compatible with the European experience and acquis has been suggested for the Biomass Support Unit (BSU).
The reasoning for the form of GEF financing is expected to be enhanced through the PPG process. At this stage the GEF funding for biomass power plants in the form of a non-grant instrument cannot be excluded (for the reasons already discussed: the development of good feasibility studies and technical designs can be addressed with targeted TA, while the provision of grants to address equity gaps is not a sustainable solution). At the CEO Endorsement stage, we expect to see the incremental cost analysis that justifies the form and the level of the GEF funding for theinvestment activities (grant or non-grant), based on the foreseen costs (supported by market data) for the selected biomass plants.	Firstly the Biomass Support Unit will identify suitable projects for financing based on a Call for proposals. Following, the BSU will use its technical capacity and also employ technical consultants to improve the bankability of the selected projects with assistance for feasibility studies and business plans on a 1:1 basis ($1 from the project developer, $1 from GEF). Potentially bankable biomass electricity generation projects will be referred to EBRD for possible financing. EBRD will conduct a separate evaluation of the potential projects and if it finds them eligible will structure and provide debt financing for their implementation. The projects will be subject to the regular approval process (applied by the EBRD to small projects) and will be expected to meet the rigorous standards of the EBRD about sound banking, environmental and health and safety regulations, among others. The EBRD will notify UNDP in writing when a project meets all criteria and it is approved for financing. The GEF grants will be then provided as an incentive payment which will be offered only to the projects successfully evaluated from EBRD in two sets: a) 30% of the grant will be provided once the project receives positive written response from EBRD in order to get the debt financing (i.e – the debt financing has been approved)

	b) the remaining 70% will be given upon project completion. Each project will get up to 20% of the capital costs as GEF grant and up to a maximum of 400,000 dollars per project.
Replication activities are expected to involve specific sustainable instruments for investment support.	See comment above for EBRD involvement
The project in its current form is very broad in scope. Successful implementation of all project components seems quite challenging in light of the limited budget allocated to individual components. Furthermore, the description of the activities under each component is very general and lacks detail, e.g. on specific institutions and stakeholders to be involved in project implementation. We would suggest a stronger focus on clearly defined fields of activity, that can be implemented within the proposed budget – rather than attempting the removal of too many barriers at the same time.	The project has focused on biomass electricity from agriculture (biogas) and forest biomass.
Furthermore, we recommend close coordination with activities of German development cooperation in further developing the proposed GEF project. As part of the German Climate Technology Initiative, a program for the biomass market development in Serbia is currently under preparation on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and will be implemented 2013-2017 through KfW and GIZ. The implementing agency should actively seek contact and exchange in order to ensure synergies and complementarities and avoid inefficient overlap of activities.	Collaboration with the KfW & GIZ is foreseen and several consultations took place during the PPG phase to ensure synergies and complementarities and avoid inefficient overlap of activities.
Apart from mentioning large cuts in GHG emissions, the PIF contains no information on the potential quantity of GHG reductions associated with the project. This makes it impossible to assess whether the project will promote global environmental benefits in a cost-effective manner.	All information for GHG emissions is presented in Annex 8.4 • Direct GHG emission reduction benefits from the pilot demonstration(s) implemented in the framework of the project and supported by project funding are estimated at 1,247,481 tonnes of CO2 equivalent will be achieved over the lifetime of the investments of 20 years. In the non-GEF case, these energy needs would be satisfied by similar generators currently providing grid electricity, with an emission factor of 0.945 tCO2e/MWh, or by a similar expansion of heat provision, with an emission factor of 0.32 tCO2e/MWh. • Indirect GHG reduction benefits resulting from broader market transformation brought about by the project activities are estimated at 397 MtCO2e. For P10 in the calculations it is assumed that 25% of the total technological and economic potential for GHG emission reductions in this area will be realized over

	10 years following project closure. Further assumptions and the calculations are presented in Table 8-2.

Response to STAP comments

STAP welcomes this project, which aims at promoting biomass energy and biomass markets in Serbia. There are a number of critical gaps in the PIF, however, that should be addressed in the project formulation stage - e.g. whether biomass combustion or gasification route will be adopted, and also whether the biomass power is for feeding to the centralized grid or for decentralized applications (off-grid)? These issues will have significant implications for project viability. Some of the following issues could be addressed during project preparation:

Question	**Reply**
1.There is a large baseline of existing policies, programs and incentives to promote biomass power in Serbia. It is necessary to analyze the limitations of these existing policies, programs and conduct a systematic barrier analysis. This analysis should inform development of secondary legislation requirements.	A barrier analysis has been conducted as part of the detailed baseline study which is available on request. In addition, a specific project Outcome (No 2): 'Stronger and more effective secondary legislation related to biomass energy is developed and approved and adopted has been included in the project plan.' The purpose of this outcome is to improve and update the legal, regulatory and support framework in the biomass sector, e.g. by correcting targets, improving support schemes or licensing procedures, harmonizing standardisation and regulations, etc.
2. STAP recommends conducting a technical and economic assessment of technologies: biomass combustion or gasification and biomethanation. What is the source of technologies? Are mature off the shelf technologies available or they will be imported?	The summary of techno-economic review of various biomass technologies conducted at PPG stage is presented in the Table 1 of the Request for CEO Endorsement, which illustrate investment and O&M cost. Financial viability of biomass projects was further analysed in the context of available feed-in tariffs in Serbia (see Table 2 and a separately provided report on Grant versus Non-Grant Mechanisms). Overall conclusion of the report and analysis is that though offered tariffs can ensure financial viability of biomass projects, the latter remain unattractive to investors due to high perceived risks of investment and requirement for equity provisions, which most of interested developers are not able to meet.
3. Economic or financial analysis of biomass energy options is critical. Financial viability depends on: installed capacity, cost of biomass feedstock, price of electricity, plant load factor, transportation cost of biomass and electricity.	Both the biomass combustion and the digestion of agricultural biomass are economic options and commercial technologies. The single project financial analysis will be subject to the next phase. During the PPG phase a techno-economic review was performed providing the cost ranges required for the pre-selection. Detailed financial viability will be checked prior to the submission to EBRD, accounting for all the above-

	mentioned factors as well
4. It is not clear whether biomass power will be used for feeding the national grid or for decentralized applications. The financial viability depends on this issue and has to be addressed at the CEO endorsement stage.	This is open to the final project configuration, but it will be mostly connected to the grid. The financial viability will be subject to the detailed project development that will take place prior to the application for funding to EBRD. Based on the PPG phase (meetings with authorities and investors) it has been suggested that the characteristic for biomass projects in Serbia so far is that even with the currently available feed-in tariffs, combined with available credits at favourable interest rates, the projects have been unable to structure financing. Municipalities or other local investors are unable to raise the necessary equity for the projects up front, or the risks associated with construction and the first several years of operation have been considered too high. These problems could be overcome by increasing the share of the grants in biomass investment projects in order to reduce the equity required from investors and/or to increase the rate of the return to a level that would reflect project risk.
5. Estimating biomass power or energy potential is recognized in the PIF. STAP further suggests to prepare a spatial biomass map and database, which should assist decision-making processes on determining an optional capacity of the biomass power plant and siting of the utility within the country.	The project document has evaluated the spatial biomass potentials at regional level. A specific project output (1.4) will also be dedicated to create the Serbian biomass atlas, with respective maps and databases and the involvement of the main authorities and Ministries.
6. Life cycle analysis of energy and CO2 emissions is necessary in the case of dedicated biomass production. In other words an energy or CO2 balance calculation is necessary to ensure the net CO2 benefits of the project and should be demonstrated in the full project document.	No specific dedicated biomass production is foreseen in the project document. The project actually focuses mostly on agricultural residues for biogas and forest residues for electricity generation at scales of approximately 1 MWe. The use of dedicated energy plantations, if any, will be minimal and will comply with the sustainable biomass production practices at European and international level.
7. The capacity and optimal location of demonstration projects is necessary to ensure minimization of the cost of biomass and maximization of plant load factor for a given biomass resource.	We agree. The final selection of the projects will be subject to very strict evaluation from both the Biomass Support Unit with the guidance of UNDP as well as the EBRD procedures for project evaluation.
8. Among several measures promoting biomass energy development in Serbia, the project proponents propose support for "energy crops" on marginal lands. Because of the controversial nature of energy crops and significant potential for adverse environmental impacts as well as potential for negative or rather neutral GHG mitigation potential, STAP recommends presenting a detailed description and justification for environmental and social safeguards - possibly using European technical standards as proposed. Furthermore, specific safeguard enforcement measures have to be described at the CEO endorsement stage.	The final project configuration has not suggested the support of energy crops in marginal lands. The project is not suggesting the conversion of land from productive agricultural use to energy crops and therefore we do not see this as an issue. European Technical Standards will be followed. Serbian legislation

9. Serbia might have sufficient stock of biomass residues from agricultural and forestry activities including animal manure. Before supporting dedicated energy plantations, STAP recommends caution and assurance that sustainable biomass production practices are adopted. These issues have to be addressed with a sufficient level of detail during project preparation.	The project actually focuses mostly on agricultural residues for biogas and forest residues for electricity generation at scales of approximately 1 MWe. The use of dedicated energy plantations will be minimal and will comply with the sustainable biomass production practices at European and international level.
10. The project focuses on the promotion of biomass energy sources for small farming communities. In addition to biomass energy, STAP recommends exploring other RE sources such as solar and wind that could be complementary and used in particular locations and circumstances. Feasibility analysis of other alternative sources would be beneficial.	We think this comment is not correct. Experience around the world has shown that working on different renewable energy technologies at the same time is not cost-effective, not efficient and does not produce good results. In addition, there was no budget provided by GEF for feasibility studies of other technologies and the investment costs for wind and solar PV are much higher and go beyond the scope and budget of this project. Wind power market is developing in Serbia on its own under business-as-usual so it is not clear why GEF support would be needed. Biomass projects, on the other hand, can be implemented on a smaller scale to match the budget of this project and the priorities of the Government of Serbia. Finally, the Government of Serbia has asked this project to have an exclusive focus on biomass energy as they understand the importance of developing focused projects.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[5]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: **80,000.00 $**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF/NPIF Amount ($)***		
	Budgeted Amount	***Amount Spent toDdate***	***Amount Committed***
1. Collection of Additional Data and Evaluation of Existing Barriers to Biomass in Serbia	26,100.00	13,648.87	2,870.00
2. Detailed Design of Investment Support Financial Mechanism and establishment of the Biomass Support Unit in the Appropriate Government Agency	38,500.00	47,689.43	-
3. Design of the Public Awareness Strategy for Project Implementation	12,500.00	12,891.62	-
4. Preparation of Project Documentation	-	-	-
5. Travel & Miscellaneous	2,900.00	925.11	1,975.00
Total	**80,000.00**	**75,155.00**	**4,845.00**

[5] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)