



PROJECT IDENTIFICATION FORM (PIF)¹

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia		
Country(ies):	Serbia	GEF Project ID: ²	4517
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	4382
Other Executing Partner(s):	Ministry of Environment and Spatial Planning, Ministry of Mining and Energy, Ministry of Agriculture, Forestry, and Water Management, Serbian Energy-Efficiency Agency	Submission Date:	2011-03-15
		Re-Submission Date:	2011-09-27
		Re-Submission Date:	2011-10-30
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Name of parent program (if applicable):	SP-4 "Promoting Sustainable Energy Production from Biomass"	Agency Fee (\$):	284,500
	• For SFM/REDD+ <input type="checkbox"/>		

A. FOCAL AREA STRATEGY FRAMEWORK³:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
CCM-3	Favorable policy and regulatory environment created for renewable energy investments	Renewable energy policy and regulation in place	GEFTF	910,000	3,500,000
CCM-3	Investment in renewable energy technologies increased	Renewable energy capacity installed	GEFTF	1,600,000	9,200,000
CCM-3	GHG emissions avoided	Electricity and heat produced from renewable sources	GEFTF	200,000	800,000
Sub-Total				2,710,000	13,500,000
Project Management Cost ⁴			(select)	135,000	500,000
Total Project Cost				2,845,000	14,000,000

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	Indicative Grant Amount (\$)	Indicative Cofinancing (\$)
1. Raising Awareness and Creating Market Demand for Biomass	TA	Improved capability of local municipalities and entrepreneurs to identify, prioritize and develop	1.1 Designed and Implemented Training Modules on Biomass Energy for local municipalities and entrepreneurs 1.2 At least 12 completed regional seminars on biomass energy that employed the designed training module	GEFTF	200,000	600,000

¹ It is very important to consult the PIF preparation guidelines when completing this template.

² Project ID number will be assigned by GEFSEC.

³ Refer to the reference attached on the [Focal Area Results Framework](#) when filling up the table in item A.

⁴ GEF will finance management cost that is solely linked to GEF financing of the project.

Energy		biomass investment opportunities in Serbia	<p>will be presented (both demand side and supply side)</p> <p>1.3 Completed studies on “The Potential of Biomass Projects in Serbia” with a focus on biogas and energy crops from agricultural</p> <p>1.4 Incorporated new course on Biomass Energy at the University of Belgrade Faculty of Electrical Engineering</p> <p>1.5 Completed national public awareness raising campaign on Biomass Energy run by the Biomass Support Unit</p> <p>1.6 Regularly organized and conducted Annual International Workshop on Biomass Energy in Serbia produced by the Biomass Support Unit</p> <p>1.7 Developed and implemented guidelines for applications for bank support for biomass projects. This will support the suggested action called for in the Biomass Action Plan (app 5).</p>			
2. Policy & Legislative Development Support Related to Biomass Energy	TA	Stronger and more effective secondary legislation related to biomass energy is developed and approved and adopted	<p>2.1 Gap analysis of Serbian technical standards related to biomass in comparison to EU technical standards.</p> <p>2.2 Harmonized EU-Serbian technical regulations related to biomass technical standards</p> <p>2.3 Appropriate licensing procedures developed and in place to support the long-term development of the biomass market in Serbia</p>	GEFTF	150,000	1,700,000
3. Mechanism for Institutional Support for Biomass Projects in Serbia	TA	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	<p>3.1 Development of model biomass supply agreements for companies by the Biomass Support Unit (established under PPG phase)</p> <p>3.2 Developed and adopted National Programme for Supporting Biomass Projects within the Biomass Support Unit</p> <p>3.3 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 Grant Mechanism</p>	GEFTF	610,000	1,200,000
4. Demonstration Projects - Investment Grant Mechanism	Inv	<p>Four biomass projects are successfully financed, constructed and operating by the end of the project</p> <p>Technical viability of specific biomass</p>	<p>4.1 Operational Investment Grant Mechanism the Biomass Support Unit of the Ministry of Environment and Spatial Planning</p> <p>4.2 (two) Agricultural Biomass projects are selected under the grant mechanism (\$400,000 ea.) and are developed, constructed and operational by the end of the project</p> <p>4.3(two) Wood Biomass projects are</p>	GEFTF	1,600,000	9,200,000

		technologies is demonstrated as the basis for replication	selected under the grant mechanism (\$400,000 ea.) and are developed, constructed, and operational by the end of the project.			
5. Sustainability and Replication	TA	At least 12 additional Biomass Projects are being supported by the Biomass Support Unit / Investment Grant Mechanism by the end of the Project	5.1 Twelve 12 additional Biomass Projects in Serbia 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	GEFTF	150,000	800,000
Sub-Total					2,710,000	13,500,000
Project Management Cost ⁵				GEFTF	135,000	500,000
Total Project Costs					2,845,000	14,000,000

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount (\$)
Bilateral Aid Agency (ies)	UNDP	Grant	310,000
Bilateral Aid Agency (ies)	UNDP	In-kind	250,000
National Government	Ministry of Environment and Spatial Planning	Cash	1,200,000
National Government	Ministry of Agriculture, Forestry and Water Management	In-kind	300,000
National Government	Ministry of Energy and Mining	In-kind	300,000
National Government	Serbian Energy-Efficiency Agency	Cash	TBD
Foundation	Standing Conference on Towns and Municipalities	In-Kind	500,000
Local Government	Local Municipalities	In-kind	500,000
Private Sector	Private Sector Cofinancing for Specific demoprojects	Unknown at this stage	10,640,000
Total Cofinancing			14,000,000

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹ N.A.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1 The GEF focal area/LDCF/SCCF strategies:

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.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities: N.A.

⁵ Same as footnote #3.

A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable; i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, 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 stipulates that renewable energy should play an important role in the development of renewable energy in Serbia and calls for 150 small hydro plants to provide an additional 100 MW of power from hydro and 4,000 small boilers to use biomass from industrial, agricultural, and forest sources.

The proposed project will help Serbia in its efforts to join the European Union. The European Union has agreed that Member States should strive to have 20% of their energy mix coming from renewable energy sources by 2020. While Serbia currently meets this target for electricity production (34% renewables of total electricity in 2009) due to large hydro, but in terms of total energy production it is only 12%. The situation could get worse going forward with the plans to build a 1,500 MW thermal power plant meaning that increased investment in renewable energy is an essential part of Government plans.

The proposed project will also build upon the recently completed Biomass Action Plan for the Republic of Serbia 2010-2012, a joint effort between the Serbian and Dutch Governments. The Biomass Action Plan concluded that the biomass potential in Serbia is significant and that there are six main areas where further work is required in order to tap into this potential. The six areas identified in the Biomass Action Plan that are targeted for further work in this proposed project are as follows:

- Security of feedstock supply and demand (Component 3.1 - Model Supply Agreements)
- Licenses (Component 2 - Policy and Legislative Development)
- Communication (Component 5 - Dissemination of Information)
- Technology and knowledge (Component 1)
- Financial and economics (Component 3 - Business Plans)
- Implementation and monitoring (Component 4 - Demo Projects)

A cornerstone of this project is the set of issues identified in the Biomass Action Plan and to address such issues appropriate measures have to be implemented in order to accelerate the development of biomass energy in Serbia.

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

Table 1: Baseline Project Activities

Barrier	Baseline Project Activities	Baseline Project Expenditures and Sources of Funding	Approx. Baseline Project Expenditure
Awareness and Information Barriers	Assessment of wood residues at the local level	Directorate of Forestry (UNDP) (50.000USD)	3,168,000USD
	Research related to energy sector including biomass	Secretariat for the Energy and mineral Resources of the Autonomous Province of Vojvodina (138.000USD)	

	Study on Biomass Potential	UNIDO (50.000USD)	
	Promotion of renewable energy sources and energy efficiency	European Union (2M USD)	
	Energy Roadmaps for Municipalities in Serbia	UNDP (250,000 USD) (150,000 cash, 100,000 in kind)	
	Municipal Guide for biomass and biogas projects and opportunity study for investments at municipal level and follow-up activities	UNDP(220,000USD) (120,00 cash, 100,000 in kind)	
	Feasibility Study on biomass for energy potential in 4 municipalities	UNDP (90,000 USD) (40,000 cash, 50,000 in kind)	
	Biomass Action Plan	Ministry of Mining and Energy (Dutch Government) (70.000USD)	
	National CDM Strategy	Ministry of Environment and Natural Resources (100.000USD)	
Legislative and Regulatory Barriers	Guidelines for obtaining the permits and licenses for RES projects	USAID and GTZ (200.000USD)	1.666.000USD
	Legal Assistance to the Ministry of Mining and Energy and Renewable energy feasibility studies for small hydro	European Union (1.38MUSD)	
	Development of Renewable Energy Framework in Serbia	NL Agency- The Netherlands (80.000USD)	
Financing barriers	Planning for the Implementation of Biomass Projects	EBRD (484.000USD)	1.384.000USD
	Sustainable Development in Energy Sector Development of Biofuels certification scheme in line with sustainability criteria defined in New RED	European Union (900.000USD)	
Business and Management Skill Barriers	Regional Biomass Study + pre-feasibility studies for fuel conversion to biomass in DHP	USAID / Hellenic Aid SYNENERGY PROGRAM (5.0 MUSD)	5.552.000USD
	Biomass Consumption Survey	European Union (276.000USD)	
	Dragacica Corn Silage Biomass PP (operating)	EIB Loan (276.000USD)	

The Serbian economy grew at an average of 5.2% over the period 2001-2008 until it dipped in the period 2008-2009 as the global financial crisis affected the country. In 2010, the economy is expected to experience moderate growth of 2-3%. Key growth generators in the Serbian economy have been the service sector, transport, storage, and communications, financial services, and wholesale and retail trade. At the same time as GDP grew, the annual growth rate in real net earnings grew by an average of 11.8% over the period 2001-08. GDP per capita was estimated in 2008 to be approximately \$6,627. As the Serbia economy grows, there will be increased demands for energy and increased pressure to generate new energy in a manner that is sustainable and contributes to global efforts to reduce greenhouse gas emissions.

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 emissions.

The energy sector is one of the largest in the Serbian economy accounting for more than 10% of GDP. According to DPM Djelic, Serbia is among the least energy efficient economies. The

country uses 3.8 times more energy to produce one dollar of GDP than the world average. And Serbia produces 6.8 times more carbon per dollar of GDP than the world average, and 10.8 times more than the OECD average (20 countries). This could be particularly perilous for Serbia if The European Union imposes border tariffs on imports from more polluting countries, as it is currently considering.

Greenhouse gas emissions in Serbia come mainly from the energy sector. The installed energy capacity of Serbia is approximately 8,355 MW of which 62% consists of large thermoelectric power plants and 34% from hydro-electric power, and 4% from other as Table 1:1 indicates. In addition, the Government is considering to build another 1,500 MW coal fired thermal power station. Renewable energy and the promotion of renewable energy traditionally have not played an important role in the Serbian economy and due to the low price of electricity and without additional incentives for renewable energy projects, this situation has not changed.

In addition to energy production from coal, Serbia Serbia imports roughly 2.5 billion cubic meters of natural gas to meet its energy needs. In energetic terms this equates to 25 TWh annually. For comparison, Serbia produces about 35 TWh of electricity each year. This natural gas is non-renewable and supplied mostly from Russia, and constitutes a major source of energy costs and GHG emissions in Serbia.

Currently the situation has started to look more favorable as the Serbian Government issued three new decrees to promote renewable energy including (1) a decree on the status of privileged producers (for renewable energy projects), (2) a decree on feed in tariffs for privileged producers (includes a guaranteed 12-14 euro cents over 12 years for biomass projects), and (3) a decree on a programme of implementation of the national strategy to 2012 to increase the share of renewable energy in the energy mix of Serbia which includes increased uptake of projects using biomass energy. Also, according to current EU accession targets, Serbia needs to increase its proportion of renewable energy in the economy to 19% by 2020. Currently this stands at approximately 12% and since the economy and energy usage is growing this means that a large amount of renewable energy will need to be deployed in the future to meet the targets. However, having targets together with new decrees to promote renewable energy does not guarantee that Serbia will be able to meet its ambitious agenda for renewable energy. Therefore interventions from international partners such as GEF are necessary so that Serbia can get access to the latest technology and knowledge regarding biomass market creation.

For example, it took Germany 15-20 years of government assistance, experimentation, and demonstration projects to develop its biogas market. Technology is only one piece of the puzzle since a market and suppliers need to exist along the entire value chain to produce biomass energy. This project will lead to more rapid biomass market development for Serbia, and through demonstration activities mobilize support for biomass energy at the local and municipal levels.

Despite the predominance of fossil fuels in electricity production in Serbia, renewables have significant role to play and of the renewable energy options available, biomass energy is by far the most promising technology followed by small hydro.

Agriculture has long been the mainstay of Serbia's economy. Roughly one-fourth of the population is involved in agriculture although cropland occupies nearly two-thirds of Serbia's territory. Serbia's has a large rural population that needs new economic opportunities and a robust agricultural sector can produce new rural jobs. The large-scale production of energy crops, which does not need to compete with food crops, can improve the rural economy while reducing dependence on imported fossil fuels. Renewable biogas and bio-methane production

from energy crops could directly substitute natural gas and be distributed through existing natural gas networks.

Among the different types of biomass energy feedstocks available in Serbia, agricultural biomass holds the greatest potential followed by biomass from wood residues in the forestry sector. Serbia has very favorable conditions (fertile land and favorable climate) for the development of agricultural production especially since a significant portion of the Serbian economy is based upon agricultural production and agricultural related industry. “Energy crop” agriculture produces extremely large volumes of agricultural biomass for use in biogas digesters or fired directly in boilers (as opposed to producing biodiesel or bioethanol). Energy crops can be produced at very low prices and is an untapped resource for Serbia . A major focus of the project will be on developing energy crops especially on marginal and idle farmland. Serbia has very favorable natural conditions (especially in the north of the country in Vojvodina) for diversified agricultural production. In particular, the water regime is very favorable and the Danube-Tisza-Danube river canal represents 604km of navigatable routes and provide excellent irrigation to a large part of Serbia.

Of the total estimated potential energy generation from biomass of 5 MToe more than 60% can come from agricultural biomass. The largest crops produced include maize (6.1 million tonnes in 2008), sugar beet (2.3 million tonnes in 2008), wheat (2.1 million tonnes in 2008), and wine (1.5 million tonnes in 2008). Energy crops, which can produce substantially larger volume of biomass, can yield up to 100T/ha of biomass which is about 10 TOE/Ha and can be also cultivated in other than Vojevodina regions. Energy crops also have a very positive affect on degraded and/or eroded farmland. By utilizing marginalized farmland and returning the soil to a better condition energy crops do not need to compete with food supply, in fact, it can increase long-term food supply for a region. Byproducts of energy generation from biomass – ash and mostly digestate from biogas production, can be returned to the fields, securing replenishment at least of a large parts of NPK nutrients. In case of agricultural biomass supplemented by wood and/or food industry waste nutrients in digestate are more than enough.

In Serbia, there are many small scale landowners who produces cereals like sunflower, soya, or wheat and larger agri-businesses represent only 25% of the total agricultural production. The wastes from biomass residues are typically not collected by the landowners unless the farms have cattle in which case it is used for feedstock. There is currently no market for selling biomass residues and consequently most of the residue is simply left to rot in the fields. GTZ is currently starting a project to promote a biomass bourse and this project will support these efforts as much as feasible.

A special effort will be made to involve small scale farmers, including supporting the development of at least one biomass/energy crop cooperative. Such a cooperative will promote the involvement of small landowners in modern and innovative practices for agriculture and renewable energy generation. It may also limit the influence of large “monopolistic” companies taking over the emerging Serbian biomass/bioenergy market. By implementing such pilot demonstration projects and undertaking activities to stimulate further investment, new possibilities will be opened for local small landowners with multiple benefits: reduction of greenhouse gas emissions, stimulation of the local economy, securing stable income for small farmers, improvements in energy supply, improvements in rural infrastructure and enhancing security of supply. Initial estimates are that most of the farms in Serbia have potential to earn additional revenue from the sale of biomass residues and growing energy crops. Farm cooperatives also could be owners or co-owners of the energy facility.

Biomass energy from waste residues in the forestry sector also offers potential in Serbia. It is estimated that the wood stock in Serbia is some 235 million cubic metres of which registered

wood felling in 2008 was 2.9 million cubic metres (slightly over 1% of the total wood stock). Biomass residues from forestry include bark, small branches, tree stumps, and leftover cuttings from logging operations. Due to poor forest management and a shortage of high quality roads, most of the wood residue from logging operations is simply left to rot and the wood residues are not utilized for any productive purposes. In addition, residues from wood processing in saw mills is often left unutilized too. These residues consist of shavings, chips, cutting edges and bark. In short, there is considerable potential from wood based biomass in Serbia. The Serbian Chamber of Commerce estimates that at least 1.5 MTOE is available annually in Serbia from wood based biomass, most of it in conjunction with forestry operations. There is also potential to generate increased wood biomass by developing energy plantations.

However, 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. New legislation which provides a high guaranteed feed in tariff for biomass projects is a good start but it is not enough on its own. In other words, pilot demonstration projects are required to catalyze future support for larger numbers of projects and create a biomass industry which can function without any need for technical assistance. The benefits from implementing a project which helps to develop new biomass markets in Serbia are threefold:

- (i) increased security of energy supply for Serbia (reduced dependence on imported energy);
- (ii) reducing greenhouse gas emissions;
- (iii) creation of employment opportunities and 'green jobs' for people in rural areas of Serbia;

While previous UNDP biomass demonstration activities in Eastern Europe have focused on (predominately) wood-waste/residues to energy, this project plans to innovate with energy crops and agriculture wastes for bio-digesters. However, there will not be focus on this type of technology. Rather it will just be one of several different technologies that the project targets in agricultural and wood waste sectors. This project shall demonstrate that formal farming in many cases can be in fact cheaper than the informal collection of agriculture residues, while at the same time providing secure supply.

Another important point is that “biomass energy” does not need to only focus on biomass to electricity. As electricity interconnections can be lacking or very expensive for some projects/regions it is useful to consider that biomass can also be used to generate heat for district heating networks and industrial boilers, or even methane/natural gas (in the case of biogas). As natural gas is an energy carrier (like electricity) there are advantages for Serbia to utilize its existing natural gas network to transport “renewable” natural gas instead of converting the biogas to electricity through cogeneration. So the project will investigate the different ways to bring “biomass energy” to market and not focus on only one alternative. Using energy crops and agri-waste for the production of biogas and bio-methane addresses several important issues:

- 1) Food versus fuel competition: Energy crops (perennial grasses) can be cultivated on degraded and eroded land, thus avoiding food/fuel competition, and besides producing biomass for energy can also improve soil quality.
- 2) Sustainability: The byproduct of anaerobic digestion of energy crops is a ready made fertilizer, containing most of the necessary nutrients. In case other organic wastes are used the fertilizer produced is more than enough to replenish the soil.
- 3) Supply security and collection logistics: Harvesting specially planted grasses which have high yield per Ha will provide security for the physical availability of biomass. In terms of commercial availability two options will be realized:

- a) Vertically intergrated biomass production /energy generation company, where farmers producing energy crops will become partners in biogas plants.
- b) Long term contracts, providing income securuty for farmers and supply security for biogas producers.

Given that many farms in Serbia are small, the project will support the creation of a farmers cooperative, in which all farmers remain independant, and the cooperative provide services like sales of products, purchase of equipment and materials, gaining benefits on volume. There are successful examples in Eastern& Central Europe (e.g. Latraps in Latvia). Special attention in the framework and implementation of this project will be paid to the replicability of supported companies/organizations.

Currently, there exists a shortage of modern/innovative biomass projects active in the Serbian market. Almost all the technologies for biomass conversion in Serbia were developed over twenty years ago. Most of the projects are out of operation and even for those which remain in operation the technologies are all outdated. The last twenty years has not seen any significant investment into new biomass projects in Serbia. However, this is poised to change Before a new biomass market in Serbia is developed and reaches maturity there are a number of key barriers which need to be overcome.

Some of these barriers were analyzed during the recently finished Biomass Action Plan for the Republic of Serbia 2010-2012, a joint effort between the Serbian and Dutch Governments. Six major problem areas/barriers were identified by the Biomass Action Plan:

- 1) Security of feedstock and supply
- 2) Licenses
- 3) Communication
- 4) Technology and knowledge
- 5) Financial and economics
- 6) Implementation and monitoring

In addition the Biomass Action Plan proposes 10 project areas which are not currently being implemented as follows:

- 1) Harmonization of Serbian technical standards on biomass and waste with those of the EU
- 2) Assessment of biomass availability
- 3) Development of policy for long-term biomass supply
- 4) Feasibility study of wood residue collection from forestry in Serbia
- 5) Development of biofuel/bioliquids sustainability certification according to EU standards
- 6) Development of sustainable cities/regions in Serbia
- 7) Development of a communication strategy for renewable energy in Serbia
- 8) Training for submitting successful project proposals to obtain EU funds
- 9) Biomass demonstration projects according to EU best practices
- 10) Development of a manual (guidelines) for applications for bank support – best practices.

UNDP is already (using its own resources) financing the study of a Municipal Guide to Biomass Energy which will aim to assist Municipalities to invest in biomass projects. Ongoing work by UNDP and funded under the baseline project includes UNDP support to the municipal biomass guide and raising awareness (\$120,000), feasibility study on the biomass potential in Serbia (us\$40,000) and the energy roadmaps for municipalities of Serbia (\$150,000). In addition, staff time for these projects and for additional seminars, workshops, and events related to the energy sector in Serbia amounts to an additional \$310,000. Total UNDP baseline

activities amount to \$530,000 of cash and in-kind contribution.

B. 2. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

In the business-as-usual scenario, 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 likelihood of new biomass projects being developed and constructed over the next 5 years is very low. GEF assistance is therefore requested to help overcome the main barriers which include the lack of awareness of the biomass opportunities in Serbia including lack of awareness of new legislation and policies designed to promote biomass energy and a lack of capacity to develop bankable biomass projects and lack of ability to finance those projects on commercially attractive terms. The number of experts in Serbia familiar with biomass technologies is very low when compared to the number of engineers and experts who have expertise in the energy sector in relation to fossil fuel energy generation projects.

By integrating work from the Biomass Action Plan, other studies, and stakeholder dialogues the project has identified four key barriers to mitigate/reduce in Serbia. The following list outlines these key barriers. These barriers and the project components that are designed to overcome these barriers are aligned with the key findings from the Biomass Action Plan for the Republic of Serbia 2010-2012. By implementing this GEF project the much of major action plan recommendations will be put in motion and executed. During the PPG phase a more comprehensive barrier analysis will be performed to further design the project to overcome the most critical barriers retarding the creation of a domestic biomass to energy market in Serbia.

Awareness & Information Barriers: There is a lack of awareness on the benefits of biomass energy or on the new conditions/new legislation that now makes it more attractive in Serbia to implement biomass projects. Creating a market demand starts with raising awareness and sharing information. There is a lack of awareness of modern options for biomass energy. Knowledge is lacking, for example, on the fact that life cycle costs of the biomass energy technologies are often competitive or even the lowest cost options. A major component of this project (Component 1) will focus on raising awareness and creating market demand for biomass energy in Serbia. Component 5 of the project will also focus on disseminating information and helping to remove awareness barriers.

Legislative & Regulatory Barriers: While there is a new decree on promoting renewable energy in Serbia (November 2009), all of the surrounding and associated regulations must also be developed and put in place. Municipalities and local entrepreneurs must be educated on how the new laws and regulations will work. Component 2 of the project will aim at harmonizing the technical standards with the EU (baseline funded), supporting identification and analysis of regulations related to technical standards (GEF funded), and government policies to support long-term supply for biomass (GEF funded)

Finance Barriers: While the cost of modern biomass to energy systems are cost competitive in Serbia (especially now with the new renewable energy tariff) there are not enough established companies involved in the Serbian market that meet the credit requirements for traditional banks. Meetings carried out in Belgrade as part of PIF preparation revealed that there is often an equity gap which makes it difficult for many project developers to finance their projects. There is an inability for many municipalities or local entrepreneurs to obtain debt or equity finance in capital markets due to inability to provide sufficient guarantees or inability to prepare

business plans or feasibility studies to a sufficiently high standard. These barriers will be reduced by the project through the development of a Biomass Support Unit within the Ministry of Environment and Spatial Planning who will develop a national programme to support biomass projects in Serbia. The support programme will be outlined and defined during the PPG phase of the project. The possibility of the Support Unit being hosted within the Serbian Energy-Efficiency Agency (SEEA) will also be considered during the PPG phase as will the potential involvement of the SEEA in the project.

Business & Management Skills Barriers: There is a lack of trained capacity to develop high quality business plans for biomass projects to attract financing among municipalities and local entrepreneurs. The project will aim to help overcome this barrier by providing training, information seminars, and by providing support for business plan and feasibility study preparation. As modern biomass to energy facilities are a new business area in Serbia demonstration projects will generate interest and “prove the concept” to local businessmen and regulators. The project will also engage all the actors and players along the supply chain so that security of biomass supply is properly addressed. To address the abovementioned barriers, this proposed project will be structured into five components as follows:

Component 1: Raising Awareness and Creating Market Demand for Biomass Energy

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.

The expected outcomes from the outputs of the activities that will be carried out under this component is Improved capability of municipalities and local entrepreneurs to identify, prioritize and develop biomass investment opportunities. The Component 1 outputs will be delivered through the implementation of the following activities: -(a) Development of Training Modules on Biomass Energy for local municipalities and entrepreneurs; (b) Development of Project Website; (c) Organization and conduct of at least 12 regional seminars on biomass energy where the training module will be utilized (both demand side and supply side); (d) Organization and conduct of study Tours to Biomass Projects in other countries in the region for selected municipalities; (e) 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; and, (g) 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. The last one will support the suggested “Refuel” project called for in the Biomass Action Plan (appendix 5).

Component 2: Policy and Legislative Development Support for Biomass Energy

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. These activities include: (a) Support for the Harmonization of Serbian technical standards on biomass and biomass wastes/residues with those of the EU; (b) Identification and analysis of regulations which may apply to energy crop production; and, (c) Development of recommended improvements (based on the assessment) which would support market development and to provide input for the development of policies supporting long-term biomass supply including through improved license procedures. This component will support and build upon the recommendations called for in the Biomass Action Plan.

Component 3: Mechanism for Institutional Support for Biomass Projects in Serbia

Component 3 addresses the barrier that there is a lack of detailed and high quality information available on potential biomass project opportunities which is 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. One way to strengthen biomass project development capabilities is to create a biomass support unit within the Ministry of Environment and Spatial planning which will provide ongoing support to developers of biomass projects in Serbia through providing information and investment grants. The decision to appoint the Ministry of Environment and Spatial Planning to manage the Investment Grant programme will be considered during PPG phase and consideration will be given to appointing the Serbian Energy-Efficiency Agency.

Component 3 aims to help overcome this barrier by providing support for business plan and feasibility study preparation and by establishing criteria for the support of selected demonstration projects. One of the criteria will be a 4:1 cofinancing to GEF ratio meaning that there should be \$4 of cofinancing for every \$1 of GEF funding spent. 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. Such activities include: (a) Support business plan and feasibility study preparation for at least 20 agricultural biomass (including energy crops); (b) provide expert assistance to the selected project developers including assessment of CDM potential and carbon finance and support for preparation of CDM documentation; (c) Work with existing banks, financing programs, and facilities in Serbia to improve their understanding of renewable/biomass energy projects; and, (d) 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 success⁶ and (e) by supporting the application for the biomass demonstration projects as potential Clean Development Mechanism projects.

Component 4: Demonstration Projects – Investment Grant Mechanism

Encouraging additional investment in biomass projects requires demonstration projects 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/energy crops biomass projects and wood-waste biomass projects. Therefore component 4 of the project will involve providing investment grants to four biomass projects (2 wood biomass and 2 agricultural biomass) and providing them each with GEF investment grants of 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\$2 million dollars of more in total costs. The selection of four pilot projects is based upon numerous discussions with financial partners in Serbia (EBRD, World Bank, IFC, GGF) which revealed that many projects face an ‘equity gap’ that means they cannot reach financial closure and receive funding. To ensure institutional sustainability, the Biomaas Support Unit, will be responsible for the management of the Investment Grant Mechanism. The four pilot projects of at least 1MW each will help to create a market demand for biomass in Serbia and it is estimated they will reduce at least 40,000 tonnes of co2e per year once they are built and operating. However, more precise figures will be calculated once the projects are selected during PPG phase. However, in order for the projects

⁶ A number of potential private sector investors have already been spoken to including Victoria Group, Bioenergy Point, Astarte Energy, Feed tec, Rudnap Group, Eko gas, Filter Frigo, and others. The private sector partners will be further elaborated during the elaboration of the PPG.

to be successful it is critical to ensure a long term reliable supply of biomass to the projects themselves. An important component of the project is to support biomass /energy crops development companies (working with local NGOs and organizations) who will enter into long-term biomass supply contracts with the demonstration projects or become shareholders of these projects. Creation of the cooperative will further stimulate involvement of small (and often the poorest) farmers and help to secure additional and stable income for them. By encouraging the participation of local organizations UNDP seeks to emphasize poverty alleviation goals in rural areas as part of the project activities.

Component 5: Replication and Sustainability

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 and investment grants by the end of this project. The financial assistance for these additional projects will not come from the GEF. It will come from additional commitments from Government and from additional private sector co-financing to be raised during the implementation of the project. In conjunction with the replication and sustainability activities there will also be

- Public awareness raising campaign on Biomass Energy
- Development of short-film on Biomass Energy based on investment in biomass pilot projects in Serbia

B.3. 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) or adaptation benefits (LDCF/SCCF). As a background information, read [Mainstreaming Gender at the GEF.](#)"

Biomass to energy and the production of energy crops for biogas provide 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 elaborated more thoroughly during the PPG phase when adequate gender mainstreaming of the project will take place in order to enable equal benefit for both men and women. Within the project context this means that women and women's environmental activists 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 but also it is crucial to support equally women for developing business plans and development of agriculture biomass/energy crops cooperatives, which is natural home for women entrepreneurs.

B.4 Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

The following risks have been identified:

1. 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 November 2009 decree on renewable energy. 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.
2. Poor cooperation between government stakeholders - (Medium) - The project will follow a highly participatory approach to its development meaning that all government stakeholders will be consulted and involved. The decision to appoint Ministry of Environment as the lead agency for this project and for the establishment of the Biomass Support unit will be reviewed during the PPG phase, as will the role of the Serbian Energy Efficiency Agency. Consideration will be given to defining an appropriate role for the Serbian Energy Efficiency Agency.
3. Inadequate project implementation - (Medium) - Careful selection of project team members and the M&E to be put in place is required. The project design aims to minimise institutional bureaucracy through the careful division of activities between government, municipalities, NGOs and the private sector.
4. Use of inappropriate biomass technologies for projects - (Low) - Only biomass technologies with a proven track record in other countries will be selected for the demonstration projects, and a thorough analysis of the entire value-chain economics will be conducted (including long-term feedstock availability: a common weakness for many biomass to energy projects).
5. Supply Risks (Medium) - Difficulty of securing long-term supply agreements on agricultural land for the supply of land. Project will work to reduce this risk by developing model supply agreements.

B.5. Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

The project will work with all of the relevant sectors of society in order transform the biomass to energy market. Key stakeholders will include:

1. Larger more established (i.e. credit worthy) energy and/or agricultural companies that will support demonstration projects
2. Local government at municipalities who will assist with project planning and promotion
3. NGOs who will assist with information campaigns
4. National governmental agencies and ministries (listed in more detail in B.6)
5. Banks and financial institutions (listed in more detail in B.6)
6. Smaller-scale farmers and cooperatives -need to provide reliable supplies of biomass feedstock
7. Local consultants and engineering firms to assist with the project design and implementation

B.6. Outline the coordination with other related initiatives:

During PIF preparation a series of initial consultations were held with relevant stakeholders and partners to identify synergies and opportunities for cooperation. The outcomes of these discussions verifies that there are few initiatives in Serbia which deals with specifically

promoting biomass energy such as the GTZ biomass bourse project and some possible interest in an initiative by the Portuguese government. The activities and programmes of a number of relevant partners are of interest to this project and are described below:

- 1) **Ministry of Agriculture Forestry and Water management** - The Ministry of Agriculture, Forestry, and Water Management is responsible for all issues related to agriculture, forestry and water management. The Ministry is prepared to offer incentives for biomass projects once a proper analysis is conducted. Directorate of Forestry is a partner of UNDP in the ongoing project “ Promotion of wood biomass at local level” that aims to assess the potential of wood residues in three pilot municipalities, estimate costs of exploiting wood residues currently left in the forests or unused in the sawmills, as well as of FAO in a TCP project related to support of the action plan for wood biomass. The Ministry of Agriculture, Forestry and Water Management will be invited to the Project Steering Committee.
- 2) **Ministry of Mining and Energy** - The Ministry is the key governmental agency in Serbia dealing with energy issues, which includes the November 2009 approval of three new decrees dealing with renewable energy. The Ministry is also leading the inter ministerial group that was in charge for the preparation of Biomass Action Plan under the framework of the Government to Government Programme supported by the Government of Netherlands. The preparation of this action plan has also been supported by the UNDP. The action plan will provide broad programmatic framework in which UNDP/GEF project proposed herewith may operate. The project will be further developed within the framework of the action plan. The Ministry of Mining and Energy will be invited to the Project Steering Committee.
- 3) **Ministry of Environment and Spatial Planning** - The Ministry of Environment and Spatial Planning has numerous competencies and implements various programmes that are of relevance for this GEF funded project main of which are: Activities related to promotion of CDM in Serbia through the DNA and various bilaterally and multilaterally supported programmes, including the preparation of the National CDM strategy for the sectors of forestry, agriculture and waste as well as through the preparation of the INC to UNFCCC; Preparatory activities in relation to the new Law on Communal Services ;activities related to promotion of cleaner production and similar. Given also the fact that this Ministry is a final approver of the programmes of both the Ecofund at the central level and Municipal environmental programmes, it is expected that activities of this Ministry will both create the framework for implementation of the GEF project and also catalyse co financing into the project activities. The Ministry of Environment and Spatial Planning will Chair the Project Steering Committee and will manage the Investment Grant mechanism of the project given that it is the most appropriate agency for this role – it has prior experience in establishing a DNA for CDM working closely with UNDP and within the Serbian Government systems its responsibilities make it the most appropriate agency for this task.
- 4) **Secretariat for the Energy and Mineral Resources of the Autonomous Province of Vojvodina** - This secretariat is leading the Council for biomass of the Province of Vojvodina and supports research in this field. Apart from activities of the public administration, the Secretariat also performs tasks pertaining to: research, development and application of all types of primary and secondary energy; research and development programmes in the field of research, exploitation and utilisation of coal, oil, gas, geothermal and mineral waters; increase of energy efficiency of facilities and energy saving, research and application of alternative energy sources and secondary raw materials which are important for development of the Province, collection of new technologies, patents and licences for the purpose of possible introduction of new products in production, on the basis of raw materials which are important for the Province, current policy of energy industry

development and performance of energy systems, development of basic geological surveys, monitoring production and consumption of all types of energy and mineral resources, creation of energy balances and balances of resources and reserves of mineral resources in the Province. The Secretariat will be invited to the Project Steering Committee.

- 5) **Standing Conference on Towns and Municipalities** - The Standing Conference on Towns and Municipalities is an all-inclusive association of local self-governments in Serbia. The organization is well equipped to provide various kinds of trainings to its constituencies – including on biomass energy. This body has commenced its activities in the field of the environment and organized a Conference on Climate Change and related opportunities for Financing in early 2010 in partnership with UNDP. The conference highlighted the importance of biomass energy as an area where municipalities could develop projects and led to UNDP financing a Municipal Guide for Biomass Energy which is currently under preparation. The Standing Conference will be invited to the Project Steering Committee.
- 6) **Energy Efficiency Agency of Serbia** - This Agency is developing a revolving fund with Donors to support energy efficiency and renewable energy projects. The fund is to be between €20 to 35 million and will provide combinations of grants and soft loans. This project will work together with the EEA to establish financing solutions for potential renewable energy projects. Further discussions will be held with the Energy-Efficiency Agency and the Agency will be invited to the Project Steering Committee.
- 7) **GTZ - Regional Stock Exchange for Biomass (Serbia, Montenegro, Bosnia & Herzegovina)** - This new project idea has been preliminary approved for financing and is expected to start early 2010 with the aim to boost regional trading in biomass energy by bringing together buyers and sellers. It will also include standardization of the commodities traded. The project will provide information to the GtZ project to be provided on the Regional Stock Exchange and the GtZ will be invited to the Project Steering Committee.
- 8) **The Centre for Strategic Economic Studies "Vojvodina CESS" of the Executive Council of Vojvodina** - CESS provides independent, strategic analyses and studies on issues related to the Serbian economy. As a part of its study on competitiveness of the economy of the province of Vojvodina CESS is financing also a study on biomass and biogas potential in Vojvodina. The study will be finalized by early 2011 and the results of this study will assist with the PPG data collection activities.
- 9) **Secretariat for Agriculture and Forestry of the Autonomous Province of Vojvodina** - This Secretariat has supported preparation of the projects in the field of biomass in previous years (project development, study tours) and has a plan to continue these activities in 2011 and onwards. The Secretariat will be invited to the Project Steering Committee.
- 10) **Secretariat for Environmental Protection** of the Autonomous province of Vojvodina - This Secretariat has competencies in the area of planning and implementation of the projects in the area of renewable energy and they will be invited to the Project Steering Committee.
- 11) **EBRD (<http://www.ebrd.org>) Sustainable Energy Efficiency Fund** - The EBRD is considering providing an equity investment of up to €25 million in the Southeast Europe Energy Efficiency Fund (“the Fund”) currently under development together with other IFIs including EIB and KfW as the sponsors of the Fund and in cooperation with the European Commission. The Fund will provide senior, subordinated and mezzanine finance mainly through local financial institutions to the Energy Efficiency sector in the pre-accession countries in the Balkan region and Turkey. Targeted investors in the SE4F would be both public and private entities. The facility will significantly increase the availability, and

therefore access to sustainable energy finance in the region, creating new products that allow actors to make small, uncomplicated energy efficiency investments that will contribute to reduced pollution, climate change mitigation, reduced energy bills, and increased energy security and comfort levels. Such investments could also include investments in biomass projects. Meetings with the EBRD during the PIF preparation phase revealed that their activities to support renewable energy in Serbia are complementary to the ones of this project.

- 12) **Green Growth Fund (GGF)** (<http://www.ggf.lu>) - The Green for Growth Fund, Southeast Europe is the first specialized fund to advance energy efficiency (EE) and renewable energy (RE) in Southeast Europe, including Serbia. Initiated by the European Investment Bank and KfW Entwicklungsbank, GGF is an innovative public-private partnership established to reduce energy consumption and CO2 emissions. GGF provides refinancing to Financial Institutions to enhance their participation in the EE and RE sectors and also makes direct investments in Non-Financial Institutions with projects in these areas. The activities of GGF are supported by a Technical Assistance Facility. This project will explore more closely during the PPG phase how it can work with GGF.

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

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 Serbia, 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

C.1 Indicate the co-financing amount the GEF agency is bringing to the project:

UNDP will contribute US\$ 560,000 to this project over five years broken down into US\$ 310,000 as a cash contribution (US\$ 50,000/year) and US\$ 250,000 as an in-kind contribution (staff resources, office costs, travel etc. (US\$ 50,000/year). The cash contribution is broken down into support for energy roadmaps in municipalities in Serbia (\$150,000), a Municipal Guide for biomass and biogas projects and opportunity study for investments at municipal level and follow-up activities (\$120,000) and planned feasibility studies in four municipalities related to biomass (\$40,000).

C.2. How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

One of the three strategic pillars under UNDP Serbia CPAP (2011-2015) aims at strengthening the "Enabling framework for environmental management and energy efficiency". Promotion of renewable energy at municipal level through "Reducing Barriers to Accelerate the Development of Biomass Markets" falls within this area.

The UNDP Country Office currently has one senior expert and two portfolio managers directly working in the Environment & Energy portfolio. Their backgrounds cover Environmental Science & Technology, International Environmental Policy, Spatial and Metropolitan Planning, Environmental Protection, Transport and Energy. They have between 7-16 years of working experience in regional and international (USA, Switzerland, Macedonia, Bosnia & Herzegovina and Serbia) development context with UNDP, the EU and other international organizations. A


fourth expert is under recruitment for a newly established position in the area of Climate Change and Energy Efficiency.

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 the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Aleksandar Vesic	Assistant Minister	MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING	

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.					
Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Fumiko Fukuoka UNDP/ GEF Officer-in-Charge		November 30, 2011	John O'Brien Regional Technical Advisor Climate Change Mitigation	+421 917 415 017	John.obrien@undp.org