PROJECT IDENTIFICATION FORM (PIF)
PROJECT TYPE: FULL-SIZE PROJECT
THE GEF TRUST FUND

Submission Date: 14 August 2009
Re-submission Date: 28 October 2009
Re-submission Date: 06 May 2010

INDICATIVE CALENDAR	
Milestones	**Expected Dates**
Work Program (for FSP)	June 2010
CEO Endorsement/Approval	Dec 2011
GEF Agency Approval	March 2012
Implementation Start	March 2012
Mid-term Review (if planned)	March 2014
Implementation Completion	March 2016

PART I: PROJECT INFORMATION

GEFSEC PROJECT ID: 4160 **PROJECT DURATION:** 4 years
GEF AGENCY PROJECT ID: 4324
COUNTRY(IES): Tajikistan
PROJECT TITLE: Technology Transfer and Market Development for Small-Hydropower in Tajikistan
GEF AGENCY(IES): UNDP
OTHER EXECUTING PARTNER(S): Ministry of Industry and Energy
GEF FOCAL AREA(S): CC
GEF-4 STRATEGIC PROGRAM(S): **CC-SP3-RE**
NAME OF PARENT PROGRAM/UMBRELLA PROJECT: N/A

A. PROJECT FRAMEWORK (Expand table as necessary)

Project Objective: Significantly accelerate the development of small-scale hydropower (SHP) by removing barriers through enabling legal and regulatory framework, capacity building and developing sustainable delivery models, thus substantially avoiding the use of conventional biomass and fossil fuels for power and other energy needs.

Project Components	**Indicate whether Investm, TA, or STA****	**Expected Outcomes**	**Expected Outputs**	**GEF Financing***		**Co-financing***		**Total ($)**
				($)	%	($)	%	
1. Policy, planning and decision-making	TA	Adapted and enhanced legislative and regulatory framework for SHP development	1.1 National SHP standards developed and testing laboratory established and functional 1.2 Capacity built within the Ministry of Industry and Energy to coordinate SHP 1.3 Legislative and regulatory framework established, including incentives and concessionary terms for the development as well as proper tariff setting and standardization for SHP	250,000	22	869,000	78	1,119,000
2. Strengthening the technology support and delivery system through technology transfer	TA	Stakeholders' technical and planning know-how enhanced and market chain for SHP developed	2.1 Technology needs assessment implemented and Industry Guide developed 2.2 Regional SHP workshop for technology providers and technology recipients conducted 2.3: Training provided for local organizations, primarily private firms and NGOs for assessment, feasibility analysis and business planning to deliver, install, service and repair SHP systems, as well as to build their capacity for business planning, live cycle	600,000	44%	778,000	56	1,378,000

			costing 2.4: The capacity of national workshops and industries to install, construct, manufacture and repair selected parts of SHP systems is developed or enhanced by means of technology transfer from selected countries 2.5 Standardised modular turbine packages for application in Tajikistan designed					
3. SHP demonstration	Investm. and TA	Pilot SHP projects (up to 5 MW in total) designed, assessed, constructed and in operation	3.1: SHP assessment and site selection completed 3.2: Awareness raised of stakeholders and capacity built (O&M, administration of SHP) 3.3: Local economic development and sustainable resources management in its watershed area 3.4 10-15 SHP projects completed, demonstrating the viability of different technologies (micro, small), delivery, operation and financing models	950,000	18%	4,253,000	82%	5,203,000
4. Monitoring, evaluation, information dissemination, and replication plan	TA	Two independent evaluations, lessons learnt publication and replication plan	4.1: Monitoring and Evaluation 4.2: Lessons learnt, experiences and best practices related to the development of SHP are compiled and disseminated 4.3: Replication plan for construction of new SHPs for up to 10 MW	50,000	100 %	-	-	50,000
5. Project management				150,000	33%	300,000	67%	450,000
Total Project Costs				**2,000,000**		**6,200,000**		**8,200,000**

* List the $ by project components. The percentage is the share of GEF and Co-financing respectively to the total amount for the component.

B. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME (in parenthesis) if available

Sources of Co-financing	Type of Co-financing*	Amount ($)
UNDP	Cash	400,000
UNDP Renewable Energy Project	Cash	1,200,000
Other donors*	Cash	1,500,000
ADB	Cash	600,000
Government	Cash	500,000
Government	In-kind	400,000
UNDP Communities Programme	Cash	1,500,000
Communities	In-kind	100,000
TOTAL		**6,200,000**

* During PIF preparation a number of bilateral donors, such as the DFID, Swiss Agency for Development and Cooperation (SDC), Central Asian Mountain Partnership (CAMP), Aga Khan Fund for Economic Development (AKFED), expressed interest in supporting the proposed UNDP/GEF project on small hydro power development to address the prevailing shortfalls in energy supply in rural areas (See Section E for details).

C. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT

	Previous Project Preparation Amount (a)	Project (b)	Total c = a + b	Agency Fee
GEF	-	2,000,000	2,000,000	200,000

Co-financing		-	6,200,000	6,200,000	
Total		-	8,200,000	8,200,000	200,000

PART II: PROJECT JUSTIFICATION

A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED:

1. Problem statement: Tajikistan is a low-income country, with per capita GNI of 1,710 US$/year it is the poorest in Central Asia and lags behind even an average sub-Saharan African country (1,869 US$/year)[1]. Today the majority (over 70%) of Tajikistan's population lives in rural areas. The civil war, the economic contraction following the collapse of the Soviet Union and the loss of social services caused a dramatic deterioration in living conditions, especially in rural areas. Nearly 100% of Tajikistan's population of 7.1 million lack access to an adequate energy supply[2]. During the winter period, the problem is linked with the disruption of the seasonal exchange of electricity between Tajikistan and Uzbekistan.

2. Fossil fuel resources are relatively limited and poorly developed in Tajikistan. Although coal reserves are abundant in certain mountainous areas, they are hardly utilized due to a lack of access roads and high development costs. As such, the country relies on the import of fossil fuels from abroad. Besides bad roads, a limiting factor is the high costs of imported fuels, which rural residents and public institutions in most cases are unable to afford. The situation described above has forced the rural population, to partially substitute for lack of electricity, to look for alternative local energy resources for cooking, lighting, and commercial use, including conventional fuel wood. Unsustainable cutting of highly valuable mountain forests contributes to the loss of biodiversity and of greenhouse gas (GHG) sequestration/storage capacity, and the resulting erosion leads to a deterioration of natural resources and an increase in natural disaster risks[3].

3. Tajikistan has great hydropower potential, and has focused on attracting investment for large-scale hydropower projects, such as the Nurek and Sangtuda-1 (670 MW) hydroelectric power stations. More hydropower projects are at the development stage, such as the Rogun power plant (2,4 GW). However, as these large power plants are oriented to power exports and large industrial estates, these form only a partial solution for rural energy supply. The problem is exacerbated by the condition of the power supply systems in Tajikistan, characterized by voltage instability, service interruptions, poor dispatch and communication systems, low cost recovery and high losses. Today over 95% of Tajikistan's power generation capacity is based on large hydro power plants, with strong seasonal variations in power production, being the lowest during winter (October – April/May), when the demand is at the highest. As a result, while the vast majority of the villages are connected to the grid, electricity is only supplied for 3 hours per day during the winter months. In summer, power supply is generally more reliable, however, a significant number of remote, non-connected rural communities remain without any electricity supply throughout the year.

4. Small-scale hydropower development: Given the country's vast small water resources, development of small-scale hydropower (SHP) is a favourable and least cost solution, particularly for remote settlement (where the cost of conventional power supply are particularly high). There is some limited experience available in using SHP in Tajikistan, the plants were built mostly during the Soviet period and have largely been phased out due to poor maintenance. In the nineties, around 20 SHPs were constructed by the state power utility 'Barki Tojik' and in the Gorno-Badakhshan region (GBAO). Most of hydro power technology transferred to Tajikistan currently is in the

[1] World Bank's World Development Indicators data-base: www.worldbank.org
[2] During the last winter (2008-2009), power supply was limited to maximum 3 hours a day to all power consumers with the exception of few "strategic" areas and group of end-users
[3] Only in Gorno-Badakhshan autonomous area of Tajikistan, 90% of forest coverage was lost during the last decade due to extensive wood cutting by local population for energy use

form of turnkey plants to the state sector, financed through international aid and/or loans (see Section F). Due to lack of technical maintenance most of these SHPs are not operational. This has put into question the relevance of centrally planned investments and look for other technology delivery models.

5. Project strategy: The objective of the project is to significantly accelerate the development of small-scale hydropower (SHP) by establishing enabling legal and regulatory framework, building technical capacities and developing sustainable delivery models, thus substantially avoiding the use of conventional biomass and fossil fuels for power and other energy needs. The barriers to sustainable development of small hydro power in Tajikistan (see Section F for discussion on barriers) will be addressed with a set of coordinated project activities, which are expected to result in the main project outcomes described in the following project components:

1) Policy, planning and decision-making.

6. The main thrust of this project component is toward the improvement of the current legislative and normative-legal documents to stimulate and provide preferential treatment in the field of production/import, construction and operation of SHP. In order to address market and regulatory barriers to SHP development, the project will develop a well-set payment system for electricity for consumers to cover all operation and maintenance expenses in off-grid systems. For grid-connected systems, adequate feed-in tariffs along with other policy support measures will be set-up to attract non-government investors. The issues of legal status of existing and new SHPs will be looked into. In order to further strengthen information exchange and foster business connections in the renewable energy sector, and to provide advisory services on technical and financing issues related to SHP development to investors and donors, developers, NGOs, community-based organizations the capacity for planning and coordination of SHP initiative within the Ministry of Industry and Energy will be strengthened. Specific outputs under this component are:

7. ***Policies and regulation to promote investment in SHP***: Support given to formulation of legislative and regulatory framework, including incentives[4] and concessionary terms for development as well as proper tariff setting and standardization of SHP in Tajikistan.

8. ***Training provided to the staff of the Ministry of Industry and Energy and other government agencies*** (e.g. Ministry of Economic Development and Trade) to coordinate and plan SHP development, and incorporate SHP in the energy sector restructuring program.

9. ***National standards and testing facilities for SHP systems***: The project will develop plans for a micro-hydro test facility plus the development of national standards. The test centre would benchmark turbines (currently the performance and efficiency of locally-manufactured turbines are very low) and help manufacturers improve them to comply with national standards (under Outcome 2). Quality and safety standards will also be developed and enforced to prevent the users being exploited by shoddy equipment and installations.

2) Strengthening of the technology support and delivery system

10. In the past technology/equipment were supplied, but on an ad-hoc basis in donor-funded projects, so expertise remains basically limited to Russian-produced technology. The capacity building and training measures will be implemented in different forms depending on the specific requirements of the respective organizations or individuals, in the form of seminars, workshops and specially designed training courses, exposing these to foreign technology of partner organizations. Another part of the capacity building will be conducted in the form of practical on-the-job trainings at partner organizations and at project sites with the objective to build the market chain for SHP services and equipment. Staff will receive on-the-job training in dismantling and assembling the equipment, as well as in repair, installation and operation (in conjunction with implementation of demo-projects under Component 3).

[4] Policy instruments that have been tried in other countries, include feed-in tariffs, fiscal measures, investment subsidies, quota obligations and green certificates

11. World experience has shown that a program of SHP development can be economically efficient if a technology equipment production basis exists in the country. But technology transfer does not only involve the transfer of the SHP hardware and strengthening the local production and assembly capacity. It involves also the transfer of knowledge about the ownership and management models, financial mechanisms and supportive policy instruments. To enable technology transfer, twinning partnerships will be developed with selected institutions and companies in those countries that have broad experience in SHP construction and implementation to enable transfer of technology and technology delivery models from these countries to Tajikistan. Specific outputs are:

12. ***Completed technology assessment***: The local communities and SMEs in Tajikistan are lacking information about different technological options available and are not in a position to pay for technology assessments. Even if they afford to do so, there is a lack of appropriate mechanisms as well as human resources required for this purpose. The project will therefore support a technology assessment for small hydropower, including system designs, grid connection, control system technologies and remote operation of systems.

13. ***Improved access to information and know-how on modern SHP technologies:*** In order to exchange and bring in information on state-of-the-art small hydro methods and technologies to Tajikistan, the project will work with the Ministry of Energy and Industry of Tajikistan to establish closer links with SHP agencies and industries in other countries, such as from EU, China[5] and Russia. This will include:
    a) Publication of a small hydro power industry guide in Russian and Tajik language based on available global reference sources such as the HydroPower Industry Guide[6];
    b) Organization of a regional workshop on small hydro power in Central Asia to provide a forum for industry representatives to meet and present their potential on one side and knowledge and technologies on the other side;
    c) Facilitating the signature of MoUs and other cooperation agreements between foreign and national SHP stakeholders in Tajikistan and otherwise facilitate the establishment of permanent networking relationships.

14. ***Completed training programs on design, construction and maintenance of SHPs***: Lessons from the previous SHP development projects reveal that lack of adequately trained manpower for design, operation and maintenance of imported machinery is a serious problem and barrier to SHP development in Tajikistan. Lack of clear provision for training of technical people from turbine manufacturer is one of the causes for inadequate expertise to handle and maintain the imported technology. This has led to dependency on foreign experts even to run and maintain the machinery, which is not affordable and thus resulted in the fact that even those few pilot SHPs installed in recent years are not operational. One of the appropriate measures for resolving this problem which the project will undertake is to ensure that training programmes are included in the technical contracts, with training of skilled workers and technicians. The project will provide micro-hydro training courses to system designers and end-users, develop and publish in-depth guides on design, installation and maintenance of micro-hydro systems. Also, training will be provided to local organisations involved in SHP development (e.g. design institutes), as well as community-development organizations (local NGOs and SMEs/productive users of SHP) for assessment, feasibility analysis and business planning, life cycle costing, and quality assurance.

15. ***Standardised SHP design developed***: The project will work with selected technology providers (turbine manufacturers) to develop a standardised, modular turbine package for application in Tajikistan through completion of research, conceptual design and economic optimisation. Standardisation will help resolve such problems as delays with procurement and delivery of imported equipment and spare parts and will ultimately lower the costs of SHP systems. Standard equipment designs for small hydro turbines and generators will be developed so that parts and components from one producer can be easily replaced by those made by another when necessary. In addition, possibilities for local production of selected components will be exploited to help develop Tajikistan's own technological capability to adapt the imported technology rather than to look for short-term solutions.

[5] China in particular has thriving SHP industry, its companies are keen to access markets beyond China and the Government of China is one of the largest investor/loan providers to Tajikistan.
[6] www.hydropower-dams.com

3) Demonstration of community-based small hydro power projects

16. This is considered the key component of the project featuring the implementation of pilot SHP projects. Through the implementation of the pilot projects the requirement for further adoption of appropriate legal and regulatory framework and market conditions for SHP systems will be assessed (see Outcome 1). The pilot projects will also be used for the implementation of local and national-level capacity building, technology transfer and awareness-raising measures. Furthermore, the pilot projects are expected to give valuable information on the suitability of, and the practical implementation of, the local delivery models developed under the project. While traditionally investments in hydropower were centrally planned, the project will actively seek other ownership including community ownership (e.g. local companies of association of energy users) as well as private ownership (local companies and/or investors).

17. Taking into account the demonstration character of the pilot projects and the associated development cost, the project will partially fund the implementation of these projects based on the incremental cost reasoning (see Section F). This will first include the incremental costs of SHP demonstration, i.e. the costs of site identification, community mobilization, technical assistance on design and engineering, institutional development, site supervision and project monitoring. Some GEF funds may be specifically earmarked to co-finance engineering design, equipment costs and civil works (suggested ratio of GEF financing for the demonstration project is 1 (GEF): 3 (Co-financing)). The remainder of financing to support demonstration will come from UNDP, bilateral donors, and local communities. Local staff will receive on-the-job training in operation and maintenance as well as administration of the SHP systems.

18. While grid-connected systems could be financially viable (depending on the feed-in tariff offered, which will be studied in this project[7]), in most cases current investment cost of isolated (off-grid) SHP systems cannot be recovered by tariff collections from (usually low-income) consumers. While it is expected that due to the project intervention the life cycle cost of renewable energy systems can gradually and significantly be reduced, it would be unrealistic to assume that the requirement for grant funding can completely be eliminated for the majority of SHP projects in the near future. To ensure the sustainability of the overall project sources of grant funding will primarily be sought to complement GEF funding beyond the life of the project. Opportunities for grant funding can come from UNDP, Asian Development Bank, the Swiss Cooperation Fund (SCF), the Aga Khan Foundation (AKF), and other donor organizations offering grants in Tajikistan. Expressions of interest were collected already at PIF development stage and will be confirmed during PPG.

19. Apart from Government financing, grant funds will also be sought to finance local economic development and access projects as well as natural resource management. Unsustainable cutting of forests practices lead to problems (such as excessive sedimentation, lack of regular water flow, etc.) that will have a direct effect on the capacity to generate electricity as well as contributing to a loss of biodiversity and of greenhouse gas (GHG) sequestration/storage capacity, while the resulting erosion leads to a deterioration of natural resources and an increase in natural disaster risks. The sustainability of the hydroelectric investment directly depends on adequate upstream watershed management practices. In the project, emphasis will be placed on constituency building through the establishment of integrated river basin committees which is currently being pursued under UNDP-EU project on Integrated Water Resources Management in Central Asia. The specific outputs of the component are:

20. ***Completed SHP assessment (site selection and pre-feasibility analysis)***: one of the key criteria for selection of demo-sites will be the local socio-economic analysis and assessment of the consumers' ability to pay for the electricity and related costs. The project will work closely with the UNDP Community Development Programme and community development initiatives of other donors (Section E) which provide grant support to local communities across Tajikistan for the establishment of various income-generating activities (such as agro-processing SMEs) whose effectiveness largely depends on sustainable power supply. By locating pilot SHPs in those areas where donor-supported SME development is taking place the project will provide for a win-win

[7] Mechanisms will be analysed and legislation will be proposed to make the state utility Barki Tojik buy SHP-generated electricity. The money generated can be used for operation and maintenance and partial recovery of investment, as well as for poverty reduction and natural resources management purposes.

solution, i.e. ensure the availability of effective consumers' demand for SHP while at the same time improving the sustainability of income-generation activities for the poor[8].

21. ***Local development and sustainable resources management in SHP and watershed area*** (100% co-financed)

22. ***SHP construction:*** The projects may include reconstruction and rehabilitation of previously constructed SHP plants, adding small SHP plants to existing water management and irrigation projects (that already have water retaining structures) and construction of SHP in the outlying districts of the power system. The project will directly support about 10-15 pilot mini and small hydropower projects (mainly grid-connected) in order to demonstrate the viability of standardized design package for different technologies (micro, small), delivery and operation models aiming at a total of 5 MW of installed capacity by the end of the project, generating about 30 GWh (gigawatt-hours) per year (co-financed, see § 17 above).

23. ***On-the-job training*** provided to local stakeholders on O&M and administration of SHPs; workshops organized for local communities, authorities and other direct beneficiaries on SHPs

4) Monitoring & Evaluation, Information Dissemination and Replication Plan:

24. ***Completed and evaluated demonstrations, disseminated information on demonstration result:*** Awareness creation and information dissemination to decision-makers form an important part of the project intervention strategy as this is expected to enhance the replicability of the project in Tajikistan and elsewhere. Lessons learnt from and information about pilot projects (such as SHP design, costs, technology) will be made available to a large number of local communities; this knowledge transfer will be facilitated by UNDP Community Development Programme which supports more than hundred Jamoat Resource and Advocacy Centers (JRACs) and Business Advisory Centers (BACs) across Tajikistan.

25. ***Replication plan***: Replication plan will be prepared and agreed upon with major stakeholders to provide for additional 15-20 projects or a total of 10 MW being constructed and commissioned without GEF assistance after project completion.

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL PRIORITIES/PLANS:

26. The Government of Tajikistan plans to rehabilitate the energy system so that it can satisfy both the domestic energy needs and the external market, followed by a next phase of market reforms that will facilitate increased interest from domestic and foreign investors. Part of the reforms includes financial rehabilitation by means of introducing payment discipline and increasing the power tariffs to about USD 0.02-0.025 per kilowatt-hour (kWh) on the short term. A next phase of stabilization and development sees the modernization and construction of all energy installation, including power distribution and raising tariffs to USD 0.05 per kWh to alleviate the poor financing that has hampered power sector development in the past. As part of the reforms, the Government is also putting larger emphasis on the development of SHP. A *Strategy for Development of Small-scale Hydropower* was prepared by the Ministry of Industry and Energy in December 2007. It aims at providing reliable and sustainable electricity provision to the population in remote and isolated areas and creating opportunities for small and medium sized businesses.

27. The *Second National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change* (2008) mentions that "since Tajikistan has a huge potential for development of small hydropower, there is a possibility to attract investments for development of renewable energy. It is estimated that if existent capacity in small hydropower (18 billion kWh) would be utilized in Tajikistan, it can

[8] Several cases were reported in the past when agro-processing units established under the Community Development Programme could not effectively operate due to unavailability of power supply which seriously undermines the effectiveness of these development efforts and resulted in the need for additional procurement of diesel-base generators and hence GHG emissions

lead to reduction of 5-6 million tons of CO_2 emissions per year. Additional socio-economic benefits are increased employment opportunities for local population and better access to energy, especially in rural areas".

28. After the First National Communication, ***Technology needs assessment (TNA)*** was performed. The report, *First National Communications, Phase 2* (2003) mentions that hydropower is the main energy source. The potential of small hydropower in Tajikistan is over 18 billion kWh a year. A construction of 20 small hydropower plants (HPPs) is possible in the Kalai-Humb, Vanch, and Rushan districts (Western Pamir). There are also perfect potentialities of small hydropower development in Central Tajikistan, where over 100 small and mini-HPPs can be constructed. It further mentions that 'To apply technologies of constructing small and mini-HPPs, the necessary production and scientific base is available in Tajikistan. Also, there is an experience of constructing and mounting these installations. However, new effective technologies, the production base development, specialists training, and service infrastructure are still needed. The cost of power generation by small and mini-HPPs can vary greatly' and 'The recently developed models are based on technologies and equipment provided by neighbouring and far-away foreign countries. When local small HPP production is developed, the specific expenditure for their installation and exploitation will be reduced by 20-30%. Demonstrating the experience and providing the population with information on small HPPs is of great importance for small hydropower development. The most urgent objective is a construction of small HPPs, 500-2500 kW, and mini-HPPs, up to 100 kW'.

C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS

29. The project will result in partial substitution of the current unsustainable use of conventional biomass (fuel wood) in the watershed areas of the small-scale hydropower (SHP) sites and of fossil fuels (diesel and coal) in grid-connected electricity generators by facilitating the implementation of SHPs with their operation and maintenance on a cost recovery basis. The project thus is consistent with GEF-4 Strategic Priority "To promote on-grid renewable energy", as it will directly contribute to the wider use of small hydro resources for power generation.

D. JUSTIFY THE TYPE OF FINANCING SUPPORT PROVIDED WITH GEF RESOURCES

30. The GEF will provide a grant for the funding of activities that will result in the establishment of a sustainable SHP program in Tajikistan substantially contribute to emission reductions. The project will support the necessary adaptations in the legal and regulatory framework as well as capacity building and technology transfer activities as detailed in Section A of the PIF. By the nature of these activities, the project requires a grant to generate the positive conditions for the SHP technology to be developed successfully.

E. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES

31. At the state level, the main stakeholders and beneficiaries of the project include the (a) Ministry of Energy and Industry, which is responsible for formulation and implementation of policies and measures in the energy sector; (b) Committee for Environmental Protection, which takes the lead in environmental policymaking; (c) Agency on Hydrometeorology under the Committee of Environmental Protection as the national UNFCCC focal point; (d) Barki Tojik, the energy producing and selling company, which is responsible for the practical implementation of all activities in the energy sector, (e) the Ministries of Economic Development and Trade and of Labor and Social Protection (which are responsible for poverty alleviation).

32. A number of donors recognize the need to address the prevailing shortfalls in energy supply in rural areas and have expresses interest in supporting the proposed UNDP/GEF project on SHP, such as the Asian Development Bank, Society Development and Support Programme (MSDSP), DFID, Swiss Agency for Development and Cooperation (SDC), Central Asian Mountain Partnership (CAMP), Aga Khan Fund for Economic Development (AKFED), and the European Bank for Reconstruction and Development (EBRD).

33. The following table lists the main project stakeholders and their role in implementation of the proposed project:

Organization/Programme	Scope of work and areas for collaboration with proposed UNDP-GEF project

Organization/Programme	Scope of work and areas for collaboration with proposed UNDP-GEF project
Ministry of Energy and Industry	The Ministry is responsible for the formulation and implementation of policies and measures in the energy and industry sector and will be a leading partner agency for the project implementation.
Agency for Hydrometeorology under the Committee for Environmental Protection	The Agency, under the Committee for Environmental Protection, is responsible for hydro-meteorological observations and forecasting, observations over water-related phenomena with regard to hydrological change and glacier studies, and in charge of the implementation of climate change policy and programs.
Open Holding Joint Stock Company "Barki Tojik"	Barki Tojik is the state-owned company controlling all power generation, transmission and distribution in the country, including electricity and thermal heat.
Ministry of Economic Development and Trade	The Ministry is responsible for investment regulation and promotion policy. The Ministry is also responsible for coordinating state agencies in their activities in this area as well as for determining the tariffs in energy sector (through its anti-monopoly agency).
Local production facilities and service providers	Apart from the utility Barki Tojik, organizations that can be involved in the construction and implementation of SHP are, for example, TadAZ, Chkalovsk Engineering Plant and Energorement, Tajiktekstilmash (construction and production) and Central Electric Networks (operation and connection). Different contractors can do the civil works construction.
Local research and educational institutes	These carry out research and development activities and are responsible for education and technical training, such as the TajikGidroenergoProekt Research Institute; Institute of Physics, Technical University, Academy of Science. The institutes can be involved in setting up SHP curricula as well as in the design of SHP.
Asian Development Bank	ADB has been supporting poverty reduction in the country through investments in infrastructure, agriculture and rural development, social sector, and regional cooperation. ADB's assistance program for Tajikistan in 2009-2013 covers investments mainly in energy and transport sectors.
Mountain Society Development and Support Programme (MSDSP)	MSDSP is a branch of the Aga Khan Development Network dedicated to improving livelihoods of the people in the mountainous regions of Tajikistan.
Swiss Agency for Development and Cooperation (SDC)	SDC's development cooperation priorities in Tajikistan include areas of local rural development/mountain development, sustainable water management, private sector development, basic services and health reform. In energy sector, SDC is committed to improve the quality of life of the Tajik population, particularly of poor people, by increasing availability and reliability of the electricity supply at an affordable price.
Communities Programme of UNDP Tajikistan	UNDP Communities Programme (CP) is a multi-year and multi-million US$ initiative, on-going since 1996. The programme has 5 area offices in Sughd, Khatlon, and the Rasht and Zeravshan Valleys. The major aim of the Communities Programme (CP) is to help local communities in different regions to formulate and address their needs and priorities through making decisions, building civic awareness, mobilizing local resources, establishing local capacities, and fostering sense of ownership. UNDP CP supports a wide network of community based organizations, such as the 116 Jamoat Resource and Advocacy Centers (JRCs), 19 District Development Councils (DDCs), 59 Business Advisory Centers (BACs), 21 Dehkan Farm Associations (DFAs), and 6 Micro Loan Funds (MLFs) that function in Khatlon, Districts of Republican Subordination (DRS), and Sughd that help the Communities Programme with over 4 million USD to achieve the aforementioned results.

34. Currently there is no project in the country addressing the root causes for and barriers to the development of SHP and local development in an integral and comprehensive approach as envisaged for the proposed project. Nevertheless, there are a number of initiatives that are complementing the planned project interventions, such as UNDP's *Communities Program* and UNDP's *Promotion of Renewable and Sustainable Energy Use for Development of Rural Communities in Tajikistan* (which is implemented under the umbrella of the Communities Program)[9].

F. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT THROUGH INCREMENTAL REASONING:

[9] The project has the following main components: (1) Enhanced legislative, institutional and regulatory framework and enhanced stakeholder's know-how and institutional strengthening, (2) Increased awareness and information uptake on renewable energy (RE) opportunities, (3) Implemented pilot RE projects in prioritized areas. Total budget is USD 1.2 million, as indicated in the co-financing table.

35. In the absence of suitable measures to promote the increased use of renewable sources of energy, more rural communities in Tajikistan will in the future be cut off from centralized electricity supply, as outlined in Section A. Due to the lack of funding and limited generation capacities in particular during winter time, the state energy company Barki Tojik will not be able to significantly improve the electricity supply situation in rural areas in the foreseeable future. Without the proposed project for most remote rural locations the only realistic alternative to the current situation would thus be the installation of unsustainable small-scale diesel generator sets within the framework of donor assisted rural development programs.

36. In the past a number of SHP projects have been realized in Tajikistan:

- From 1994 to 1999 Barki Tojik installed 7 small-scale hydropower stations with capacities of between 70 to 630 kW.
- Over the same period 12 micro hydropower plants with capacities of between 30 to 100 kW were constructed in GBAO with financial support of Aga Khan Foundation. Reportedly most of these plants are not operational anymore due to technical failures.
- Under the USAID funded Community Action Investment Project (CAIP) 4 micro hydropower plants with capacities of between 15 to 20 kW have been constructed since 2003.
- Under the SIDA funded Poverty Reduction Program 3 micro hydropower plants with capacities of between 20 to 30 kW have been implemented since 2004.
- Within the scope of the ADB project Development of Community Based Micro-Hydropower Supply in Rural Areas currently 2 mini hydropower plants with capacities of between 100 to 200 kW have been implemented.

37. All these projects have in common that they lack a comprehensive approach to remove underlying barriers to sustainable development of renewable sources of energy. Consequently, ***to date none of the above initiatives has resulted in any replication of the individual SHP projects implemented***. It can thus be concluded that a number of key barriers to small hydro power development in Tajikistan will remain in the future without GEF intervention, including:
    - *Institutional and regulatory barriers:* The major barrier to small hydro power development in Tajikistan is the presence of excessive administrative regulations that distort business incentives, create an anti-competitive climate, and increase burdens related to permits and an unclear license and inspections system imposed on consumers. The prevailing institutional and regulatory framework in the energy sector treats SHP as a scaled-down version of the large centrally planned hydroelectric schemes and is therefore not adequately taking into account the potential of SHP. Component 1 of the project is designed to address these barriers by working on a number of legislative initiatives and technical regulations which could provide preferential treatment in the field of production/import, construction and operation of SHP.
    - *Capacity and technological barriers:* While manufacturing facilities with most of the required equipment and machinery are available in Tajikistan, there is a lack of technical and engineering capacities for the national manufacturing of the electromechanical equipment, design, installation and repair of SHP systems with the required quality assurance. Especially in the rural areas there is only very limited local technical know-how available on how to properly administrate, operate and maintain SHP systems. There are also no well-established and functioning supply chain and technology support system in place which would ensure broad availability of such systems and better service support for end-users. The low quality and quantity of skilled and competent workers in the power sector also adds to the rising cost of electricity due to the need to rely on expensive imported services even for basic repair and maintenance. Under Component 2 technical assistance will be provided to strengthen capacities, knowledge and skills of local SHP technology suppliers.
    - *Market barriers:* There is currently a lack of a functioning market for the possible applications of SHP in Tajikistan. The key factor which undermines financial viability of SHP is the absence of effective market demand for SHP which stems from a lack of obligation to purchase excess power by the national power monopoly, Barki Tojik, during the summer period, as well as a low ability to pay by local consumers. The project will address these barriers by adopting conducive and preferential market environment for SHP at national level (Component 1) and supporting productive users of SHP power at local level (co-financed through the Community Development Programme).

38. The barriers indicated above are interrelated. The removal of only some, but not all of them, will not lead to sustainable development and application of the SHP sector in Tajikistan. GEF support is sought to address and overcome the above mentioned barriers in a holistic approach by promoting the supply of and ensuring effective demand for SHP in Tajikistan.

G. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND IF POSSIBLE INCLUDING RISK MEASURES THAT WILL BE TAKEN:

Risk	Risk Rating	Mitigation Measures
Widespread poverty and lack of sustainable source of income resulting in low ability to pay for energy supply services	Substantial	- Co-financing through Community development programme will support establishment of income-generating businesses in the areas where pilot projects are to be located in order to ensure solid client base for pilot SHPs and maximize consumers' ability to pay - Optimization and standardization of system design to lower down SHPs costs - Identification of sources of grant funding to co-finance the implementation of renewable energy systems until life-cycle cost of the systems have decreased to a level affordable for rural communities or incomes have increased;
Investors (community-owned, public or private sector) do not get sufficient return on investments	Substantial	- Work with four UNDP-supported micro-loan funds to include support for SHP investment in their scope of operation - In general, raising of electricity tariffs for the consumer - Proper incentives for investors (e.g. feed-in tariffs, fiscal measures, quota obligation, subsidy on investment)
Slower than expected implementation of the pilot SHP projects	Substantial	- Involvement of suitable experts to ensure sound design for the pilot SHP projects - Close supervision of the implementation of the SHP plants - Incentives for timely (or penalties for late) provision of previously committed local (in-kind) contributions to project implementation
Slower than expected development of a national market for SHP systems and thus higher than expected costs of such systems	Moderate	- Attracting further support from donor organizations to provide initial grant funding for SHP development - Capacity building and technical assistance to facilitate development of supply chains
Slower than expected improvement of the institutional framework for SHP development	Moderate	- The Project Steering Committee will closely coordinate with relevant Government institutions to support timely implementation of commitments
Insufficient quality of locally produced equipment leading to early break-down of the renewable energy systems and dwindling consumer confidence in the technology	Moderate	- Capacity building measures for local equipment manufacturers and service providers - Regulatory measures to set and enforce quality standards
Lack of interest in renewable energy systems on the part of local stakeholders (communities, beneficiaries) due to perceived inferiority compared to grid supply	Low	- Awareness campaigns on the potentials and limitations of SHP systems - Information campaigns on the Government's plan to improve grid energy supply in rural areas

39. The project risk is rated moderate to substantial. In particular the affordability of off-grid/grid-connected systems for local communities as well as investment in grid-connected systems by public and private sector investors will be a critical success factor for the project. It is clear that initially investors will not be able to pay the full cost of SHP systems, unless offered some form of incentives/grant support. Only when the market starts to develop and the sales of such systems increase, prices per kW can be expected to come down and be more affordable. Therefore, the project will support local investors and communities at the locations of the pilot projects.

40. The grant components of the pilot projects implemented during the project's lifetime will be assessed regarding the expected falling trend and the future requirement for grant funding. Should the requirement for substantial grant funding beyond the project's duration become evident, the project will work together with the Government and donor organizations to establish further sources of grant funding for SHP systems.

H. DESCRIBE THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT:

41. Expected CO_2 emission reduction from the 5 MW of (grid-connected and off-grid) hydropower generating about 30 GWh (gigawatt-hours) per year is 24,000 tCO_2 per year or circa 0.48 million tCO_2 over the technology life-cycle, assuming a load utilization factor of 70% and the baseline alternative of power production by diesel and coal-fired generators. This is an equivalent of GEF US$2/$tCO_2$ which is rather cost-effective in comparison to other CO_2 abatement options in Tajikistan and globally. These figures are indicative only. During the PPG phase the exact number of plants and total installed capacity with the corresponding CO_2 emission reduction will be determined with more precision.

I. JUSTIFY THE COMPARATIVE ADVANTAGE OF GEF AGENCY: UNDP

42. The project is a climate change capacity building and technology transfer intervention on small-scale hydropower that falls under UNDP's comparative advantages as presented in Annex L of the document GEF/C.31/5 rev.1. Specifically, the focus of the project is to create enabling market environment, building capacities and leverage investment in local community-owned small hydro power projects. Globally, community-based development is at the core of UNDP's strategy and mandate to alleviate poverty, promote self-governance, and build local capacities. Within the UNDP-GEF portfolio there are numerous examples of successful projects promoting investment in SHP at the community level, such as in Nicaragua, Chile, Costa Rica to name just a few. In Tajikistan, UNDP has been supporting community development since 1996 and leveraged over 50 m. US$ for community-based infrastructure projects and SMEs.

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

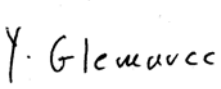
A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the country endorsement letter(s) or regional endorsement letter(s) with this template).

NAME	POSITION	MINISTRY	DATE *(Month, day, year)*
Khursandqul Zikirov	Chairman, GEF Operational Focal Point	**Committee on Environmental Protection**	31 July 2009

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
Yannick Glemarec UNDP/GEF Executive Coordinator		May 06, 2010	Marina Olshanskaya UNDP/GEF Regional Technical Specialist on Climate Change, Europe and CIS	+421-259-337-285	marina.olshanskaya@undp.org