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**United Nations Development Programme**

**Republic of Tajikistan**

**Review of GEF Project:  
Technology Transfer and Market Development for  
Small-Hydropower in Tajikistan**

(PIMS No: 4324)

**Mid-Term Review Report**

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## SYNOPSIS

**Title of UNDP supported GEF financed project:** Technology Transfer and Market Development for Small-Hydropower in Tajikistan

**UNDP Project ID:** 4324

**GEF Project ID:** 4160

**MTR time frame:** April 2012 to July 2014

**Date of MTR report:** October 18, 2014

**Region and Countries included in the project:** Europe Central Asia, Tajikistan

**GEF Focal Area Objective:** CCM-3: Promote Investment in Renewable Energy Technologies (GEF-5)

**Implementing partner and other strategic partners:** Ministry of Energy and Water Resources (MoEWR), Government of Tajikistan

**MTR team members:** Mr. Roland Wong, International Consultant; Mr. Furughzod Usmanov, National Consultant.

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## ABBREVIATIONS

ADB	Asian Development Bank
AKFED	Aga Khan Fund for Economic Development
AWP	Annual work plan
BOMCA	Border Management Programme in Central Asia (under UNDP and EU)
BT	Barki Tojik
CASA 1000	Central Asia South Asia Electricity Transmission and Trade Project
CDM	Clean Development Mechanism
CP	Country Programme
CP	Communities Programme (UNDP project)
CPAP	Country Programme Action Plan
CO <sub>2</sub>	carbon dioxide
CTA	Chief Technical Advisor
DEX	Direct Execution Modality of UNDP Projects
DCC	Donor coordination committee
EA	Executing Agency
EBRD	European Bank of Reconstruction and Development
EE	energy efficiency
EOP	End of Project
ER	Energoremont plant
FSP	Full-Size Project
GBAO	Gorniy Badakshan Autonomous Oblast
GEF	Global Environment Facility
GHG	Greenhouse gas emissions
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit or German International Technical Assistance
GoS	Government of Switzerland
GoT	Government of the Republic of Tajikistan
HPP	hydropower plant
IA	implementing agency
IFC	International Finance Corporation
IRD	integrated rural development
JICA	Japan International Cooperation Agency
kW	kilowatt
KM	Korgohi Mashinasozi (formerly “Tajiktekstil mash”)
KOICA	Korean International Cooperation Agency
ktCO <sub>2</sub>	kilotonne of carbon dioxide
LITACA	Project for Livelihood Improvement in Tajik-Afghan Cross-Border Areas (under JICA)
LLC	limited liability corporation
IPP	Independent Power Producer
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
MoEDT	Ministry of Economic Development and Trade
MoEWR	Ministry of Environment and Water Resources
MoIE	Ministry of Industry and Energy
MINT	Ministry of Industry and New Technologies
MoU	Memorandum of Understanding

MTR	Mid-Term Review
MW	megawatt
NGO	Non-governmental organization
NPC	National Project Coordinator
NTF	National Trust Fund
O&M	operation and maintenance
O&M&M	operation, maintenance and management
PIR	Project implementation report
PM	Project Manager
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPM	Project planning matrix
ProDoc	UNDP Project Document
PSC	Project steering committee
QPMM	Quarterly project monitoring matrix reports
RE	renewable energy
RES	renewable energy sources
SCF	Swiss Cooperation Fund
SDC	Swiss Agency for Development and Cooperation
SGP	Small Grants Programme of GEF
SHP	small hydropower
sHPP	small hydropower plant
SIDA	Swedish International Development Agency
SMART	specific, measurable, achievable, relevant and time-bound
SME	small and medium enterprises
TT	GEF Tracking Tool
TTU	Tajik Technical University
Tonne CO <sub>2eq</sub>	tonne of carbon dioxide
UNFCCC	United Nations Framework Convention on Climate Change
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USD	United States dollar

## EXECUTIVE SUMMARY

### Project Information Table

Project Title:	Technology Transfer and Market Development for Small-Hydropower in Tajikistan			
GEF Project ID:	4160		<i>at endorsement (Million US\$)</i>	<i>at midterm review (Million US\$)</i>
UNDP Project ID:	4324	GEF financing:	2.000	0.458
Country:	Tajikistan	IA/EA own:	4.750	1.210
Region:	Europe and Central Asia	Government:	1.500	4.400
Focal Area:	Climate Change	Others:	0.200	0.322
FA Objectives, (OP/SP):	CCM-3: Promote Investment in Renewable Energy Technologies (GEF-5)	Total co-financing:	6.450	5.932
Executing Agency:	UNDP	Total Project Cost:	8.450	6.390
Other Partners involved:	Ministry of Energy and Water Resources	ProDoc Signature (date project began):		2012-04-01
		(Operational) Closing Date:	2015-12-31	2016-03-31

### Project Description

The “Technology Transfer and Market Development for Small-Hydropower in Tajikistan” Project (also referred to as the “Project”) aims to improve the access to clean energy for Tajikistan. With an abundance of water resources and mountainous terrain, Tajikistan has an abundance of hydropower potential. However, despite this abundance, the country still experiences energy shortages for several reasons mainly due to the high electricity demand in the winter mainly for heating and low hydropower generation in the winter, and increasing the demand for conventional biomass and fossil fuels for power and other energy needs. Conversely, during the summer months, there is ample hydropower generation from spring and summer runoff producing an excess supply of electricity. In addition, Tajikistan is also highly reliant on hydropower, making it vulnerable to climate change. Changes in the snowpack that are affected by climate change will impact the country’s ability to generate hydropower as well as meeting water demand for other activities that are water intensive such as agriculture.

The Project addresses problems in the development of small hydropower plants (sHPPs) in Tajikistan including:

- the existing low tariffs do not provide full cost recoveries of new power plants even though there is existing legislation for the establishment of tariffs to ensure full cost recovery. This particularly affects the national utility, Barki Tojik (BT) that owns and operates the majority of hydropower and other power generation assets in Tajikistan, despite the fact that BT is nearly bankrupt;

- institutional capacity that currently is only able to address large hydropower development but does not have sufficient capacity for formulating strategic plans and managing a programme for small hydropower (SHP) development;
- lack of a developed supply chain for locally produced SHP equipment. All SHP electro-mechanical equipment is now imported from Russia or China;
- lack of skilled workers with vocational skills required for constructing sHPPs as well installation of SHP-related equipment; and
- poor operation and maintenance of sHPPs.

### Project Progress Summary

- On Outcome 1, Project resources utilized to assist the MoEWR and Barki Tojik with the amendments to rules and regulations to implement a new law on “renewable energy sources” (RES Law) has been *moderately satisfactory*. The RES Law will:
  - permit Barki Tojik to purchase of electricity from an independent power producer (IPP) such as LLC Dehboti Obod, operator of the 200 kW Nurofar SHP at Burunov Jamoat. UNDP Tajikistan and the Project had been supporting the Jamoat with an SHP-based IRD project “Scaling up of Area Based Integrated Rural Development” from 2009 to 2011;
  - streamline existing procedures for the licensing and construction of SHP projects; and
  - provide the legal basis for the establishment of a National Trust Fund (NTF) that will serve as a pool of financing resources for all investments into RES and EE development.

The issue, however, is likelihood of not achieving the target of a fully operational and capitalized NTF for which no sources of capital have yet been identified. Without a definition of how the funds in the NTF will be utilized, donors are reluctant to capitalize such a fund;

- On Outcome 2, *satisfactory* progress was achieved in the building of local capacity for SHP development. Activities included the development of an SHP guidebook, identification of local manufacturers to build capacity, and working with them to manufacture, install and repair SHP equipment and appurtenant components;
- On Outcome 3, *satisfactory* progress has been achieved with the technical and economic viability of SHP-based rural development models that were demonstrated with the aforementioned SHP-IRD model in Burunov Jamoat. This has provided confidence to future investors that the SHP operations can be sustained in Tajikistan;
- On Outcome 4, there has not been sufficient progress to merit a progress rating for the National Scaling-up programme for RE-based IRD. The case study of the Burunov jamoat IRD with the development of SHP for the community has been prepared. In addition, the GoT reports that USD 6.4 million was expended on 6 sHPPs (total installed capacity of 3.74 MW) during the 2012-13 period. A conference to share the findings of this Project is proposed for early 2016;
- A number of challenges have been encountered during implementation of the Project:
  - Progress on the establishment of the “National Trust Fund” for RE and EE (Output 1.1) has encountered issues regarding a weak design and donor reluctance for its capitalization. These issues are further discussed in Section 3.3.1;



- Delays were encountered in the identification and contracting of a suitable company to provide technology transfer services and designs for pilot sHPPs. The issue was an initial lack of interested companies that resulted in the loss of 2013 in terms of preparing designs for 5 sHPP pilot projects (Output 3.1), and delays in technology transfer activities to local workshops (Output 2.2);
- Delays in the completion of the micro 15 kW hydropower project “Dashti Yazgulam” due to unsatisfactory quality of the constructed works. This included the powerhouse not complying with the original roofing and wall insulation designs, and delays until early 2014 to complete pressure testing of the intake pipe to the powerhouse which were duly addressed to complete the sHPP; and
- Delays in the start-up of local manufacture of electric and biomass-fired heating and cooking devices for rural households (Output 2.4) due to flooding of the Tajik market with cheap goods;
- Direct GHG reduction targets are not going to be met due to their overestimation in the ProDoc. Reasons for the high estimates include:
  - ⇒ The original estimate being based on the assumption of 27 SHPs with total installed capacity of 2.5 MW to be supported by the project, compared with just only 7 SHPs with 0.67 MW of total capacity currently facilitated by the Project, and 2 sHPPs being financed and developed by the GoT that have benefitted from technical assistance of the Project;
  - ⇒ An assumption that off-grid sHPPs use 50% diesel fuel and 50% wood fuel for energy in comparison to actual baseline energy surveys which indicate more than 80% of the energy needs are serviced by wood fuel. As such, actual off-grid sHPP emission factors are far less than those assumed in the ProDoc.

### Mid-Term Project Ratings and Achievement Summary

These are provided in Table A.

**Table A: MTR Ratings & Achievement Summary Table for Project**

Measure	MTR Rating	Achievement Description
Progress Towards Results	Goal: Reduction of GHG emissions from energy use by rural and remote communities <b>Achievement Rating: 2 (Unsatisfactory)</b>	The target for sHPPs was scaled back during the Inception Phase from 27 to 10 sHPPs to the current number of 7 sHPPs based on anticipated delays in building local manufacturing capacity. This scale-back has had the impact of reducing the achievable direct GHG emission reduction targets: <ul style="list-style-type: none"> <li>● Cumulative direct GHG reductions to end-of-project (EOP) of less than 2,000 tonnes CO<sub>2</sub> (based on current plans for developing 7 sHPPs plus the completion of 5 sHPPs developed and financed by the GoT ) in comparison to the cumulative EOP target of 45,000 tonnes CO<sub>2</sub>; and</li> <li>● Lifetime direct GHG reductions (assuming a 30-yr lifetime of the aforementioned sHPPs) of 59,910 tonnes CO<sub>2</sub> in comparison to the lifetime direct target of 244,000 tonnes CO<sub>2</sub></li> </ul>
	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	There has been moderately satisfactory progress in the removal of legal and regulatory barriers as well as capacity building for government personnel and personnel to accelerate the development of SHP. Capacity building for local workshops in Tajikistan involved in the supply chain for electro-mechanical equipment is progressing slowly due to initial problems sourcing appropriate technical assistance for the Project. There is a minor issue with the need for some clarity on the indicators for

	<p>substantially avoiding the use of conventional biomass and fossil fuels for power and other energy needs.</p> <p><b>Achievement Rating: 4 (Moderately Satisfactory)</b></p>	<p>electricity generation of newly installed sHPPs. The outcome of these activities, however, has led to 50% of the sHPP power generation targets being met after 31 months of Project activity.</p>
	<p>Outcome 1: Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country.</p> <p><b>Achievement Rating: 4 (Moderately Satisfactory)</b></p>	<ul style="list-style-type: none"> <li>• Substantial progress from the Project work on simplified procedures for the licensing and construction of sHPPs, adoption of the tariff methodology calculation, and the adoption and operationalization of the RES Law by 2013;</li> <li>• Training for government personnel on the application and processing of the RES Law for new sHPPs; and</li> <li>• Legal basis for a National Trust Fund for Renewable Energy (NTF) formed with the new Energy Efficiency and Energy Saving Law.</li> <li>• Progress on capitalization of the NTF, however, has been stalled due to the lack of a strategic plan for RE development, no stated purpose of the Fund, and the consequent reluctance of donors to capitalize the NTF.</li> </ul>
	<p>Outcome 2: Enhanced technical and planning know-how and developed market chain for SHP in Tajikistan</p> <p><b>Achievement Rating: 5 (Satisfactory)</b></p>	<p>Achievements of this outcome are characterized by</p> <ul style="list-style-type: none"> <li>• Timely completion of SHP development modules for use by SHP financiers and developers in Tajikistan;</li> <li>• Timely introduction of the SHP development modules in the education system through the Tajik Technical University and the Tajik Energy Institute in Kurgant'yube;</li> <li>• Selection of two local manufacturing entities for the purposes of building their capacity for manufacturing electro-mechanical equipment for sHPPs;</li> <li>• Development and implementation of capacity development plans for technology transfer by Komperg, a Croatian company for manufacturing of turbines and other equipment for sHPPs that took one extra year due to difficulties in sourcing this type of expertise (i.e. a technology company willing to share if technology and have it manufactured in a developing country);</li> <li>• Delayed vocational training for SHP operational entities in the design, construction and O&amp;M of sHPPs; and</li> <li>• Efforts to build capacity of local manufacturers for production of electric and biomass heaters has been stalled due to the flooding of the Tajik market with less costly heating equipment.</li> </ul>
	<p>Outcome 3: Improved confidence on the technical and economic viability of integrated SHP-based rural development mod</p> <p><b>Achievement Rating: 5 (Satisfactory)</b></p>	<p>Achievements of this outcome are characterized by</p> <ul style="list-style-type: none"> <li>• Prefeasibility studies were prepared for 27 sites from which 10 sites were selected for feasibility studies and possible development;</li> <li>• District development plans completed;</li> <li>• Successful activities to bring the community-owned sHPP in Burunov jamoat to operate on a sustainable basis. Subsidies have recently been removed from the operations of this sHPP;</li> <li>• There is a signed PPA between the sHPP management team and Barki Tojik for the sale of excess electricity to the national grid; there was support for the development of a mini-dairy by the Burunov jamoat that used the electricity from the sHPP;</li> <li>• A minor issue exists with the target of 10 communities for SHP demos/pilots that incorporate IRD approaches. This</li> </ul>

		target should be re-adjusted
	Outcome 4: National Scaling-up Programme of Renewable Energy-based Integrated Rural Development <b>Achievement Rating: Cannot rate due to insufficient progress</b>	There is progress on all outputs with the expectation that the outputs will be achieved by EOP.
<b>Project Implementation &amp; Adaptive Management</b>	<b>Achievement Rating: 5 (Satisfactory)</b>	Project has been effectively managed considering the challenges and actual progress to date. After Year 3, the Project is preparing for the construction of 2 sHPPs in 2015, and has managed to obtain an agreement on co-financing for capital cost of another 2 sHPPs from JICA. The current role of the CTA is assisting the Project to adaptively manage its activities including adjusting the Project's assistance towards the establishment of the National NTF.
<b>Sustainability</b>	<b>2 (Moderately Unsustainable)</b>	Mainly based substantial financial risks and risks related to the institutional framework and governance of the energy sector: <ul style="list-style-type: none"> <li>• With electricity tariffs for sHPPs are not sufficient to induce investment, other sources of revenue are required to sustain SHP development in Tajikistan. The demonstration of the Project's approaches to finding the additional sources of revenue (i.e. through bilateral contracts with local businesses) are crucial to reducing financial risks to sustainability;</li> <li>• Capacity of government personnel to consistently apply the new RES Law and streamline the approvals of new sHPPs will not be sufficient by the EOP. More capacity building resources will be required after the EOP for this purpose;</li> <li>• Capacity of the local jamoats for implementing best practices for O&amp;M of sHPPs will not be sufficient by the EOP. More capacity building resources will be required after the EOP for O&amp;M training.</li> </ul>

## Conclusions

- The primary cause of slow development of sHPPs in Tajikistan is related to low electricity tariffs and a resulting poor investment environment. As such, the continuation of the development and sustained operation of sHPPs will depend to a large extent on the ability of the Project and the Government to demonstrate that revenue can be generated from within the jamoats where IRD activities along with SHP developments are located. The challenge is for the proper maintenance and operation of these sHPP investments over the next 5 years or whenever new revenue sources (such as revenues from local economic activities or the CASA 1000 Transmission Project) can be realized;
- According to the latest information, the CASA 1000 Project is a possible source of sustained subsidy funding for sHPP operations by 2018<sup>1</sup>. If so, this Project has more strategic importance in building the capacity of Tajikistan's supply chains and institutions to position the country to develop sustained SHP power generation for rural communities over the next 4 to 5 years, and

<sup>1</sup> The CASA 1000 Project is designed to deliver hydropower from Tajikistan and Kyrgyzstan through newly constructed transmission lines (financed through World Bank financing) to Pakistan and Afghanistan electricity markets in return for an estimated USD 200 million annually into the Tajikistan market. A re-structured Barki Tojik can possibly allocate this revenue into subsidies for electricity to rural marginal income households that will benefit from electricity from sHPPs developed by this Project as well as the Government.

to maximize its economic benefits using the IRD approach for community development. This can be augmented through demonstration of the IRD approach with the sHPPs being planned for construction during 2015 (for the 100 kW Pinyon SHP and the 100 kW Hijborak SHP as well as the 30 kW Sorvo SHP currently being constructed); these SHPs will provide a reliable supply of electricity and generate community-based sources of revenue to sustain purchases of electricity generated from these SHP investments;

- In consideration of the challenges encountered, the Project is being implemented in a satisfactory manner on most activities related to building capacity for SHP development, institutionally and at the beneficiary level. There are areas, however, that will need more focused assistance towards the meeting Project targets including:
  - ⇒ Improving capacity of the workshops towards timely delivery of quality turbine products. Welding quality and working capital of the supply workshops are issues. Komperg, the TT consultant for the Project, is in the process of organizing workshops to improve the quality of welding on the electro-mechanical equipment;
  - ⇒ There are efforts underway as of January 2015 to hire general contractors for the civil works and construction of the sHPPs at Pinyon and Hijborak. Given the uncertainty of the capacity of local contractors to complete these sHPP works in remote areas, the tendering of these works will require careful preparation and strategic inputs from the Project's construction engineers. The reasons for these inputs is to undertake a critical review of construction plans to reduce the uncertainty of tendered construction costs, to conduct an in-depth review of the abilities of civil contractors to implement sHPP construction in remote areas<sup>2</sup>, and to formulate unique contracting arrangements that will reduce cost uncertainties and increase probabilities of timely delivery of completed sHPPs<sup>3</sup>;
  - ⇒ Provision of sufficient engineering inspection and oversight of all activities from the quality of workshop products to the quality of civil works being constructed as designed, and adhering to schedules provided under the contract. If necessary, there should be mechanisms to change the designs as deemed necessary from new site condition information;
  - ⇒ Operation and maintenance of sHPPs. It is understandable that not much attention has been paid to this issue given the primary focus is currently on demonstrating successful construction of sHPPs. However, once two sHPPs are completed in 2015, there will be a focus on O&M of newly commissioned sHPPs;
  - ⇒ Further to O&M of sHPPs, there is no attention is being paid to more than 150 dysfunctional sHPPs which have been constructed over the past 20 years from the state budgets (as reported in the Parliamentary hearings of December 2012). Based on the visits of the Head of the Electrical Engineering Department of TTU to a few of these sHPPs, he recommends that an expert assessment be conducted for each of these sHPP facilities including details of the repairs or design adjustments and routine maintenance required. The Project needs to position itself to provide assistance to O&M issues at the jamoat level for these sHPPs;
- With the current Project EOP date of April 1, 2016, there is only one season remaining to construct pilot sHPPs. Recent progress reports indicate only 2 sHPP pilot projects will be ready for construction in 2015 (Pinyon and Hijborak), with the Project only being able to achieve the completion of 4 sHPPs by the EOP date (this includes Dashti Yazgulam and the Sorvo SHPs), 1 short of the target of 5 sHPPs;

<sup>2</sup> This would include an estimate of the company's working capital, estimated costs to mobilize and operate in a remote sHPP location, and risks to the construction schedule based on weather and other logistical risks.

<sup>3</sup> This may include an option to allow a contractor to bid on two sHPP sites.

- Despite the commitment of the LITACA Project to provide capital funding for Jilikul and Shurobod sHPPs, these will not be completed by the current EOP date of April 1, 2016 since the designs will be prepared through Komperg in 2015 with actual construction and commissioning of these sHPPs by late 2016, after the EOP date;
- With the remaining resources on the Project budget, supporting the establishment of the National Trust Fund (NTF) for RES and EE at this time is not as important as ensuring the successful completion of pilot sHPPs. Despite the high priority placed by the GoT to establish the NTF, the lack of interest from the donors to capitalize the NTF substantially increases the likelihood that the Project target to establish an RE Trust Fund by the EOP can no longer be achieved;
- The work being done by the Project fills a large void in the arena of donor assistance to the energy sector of Tajikistan.

## Recommendations

### **Recommendation 1: The Project should have as a top priority the successful completion and operation of the 4 sHPP projects currently under implementation**<sup>4</sup>.

To do so, this Evaluation supports the Project's decisions to recruit competent individuals for coordination and management of the construction contracts. In addition to the UNDP Resident Engineer already on staff, two additional project engineers and a part-time CTA are required to:

- provide additional inputs into tendering cost estimates in an effort to reduce its uncertainty and provide more certainty to the UNDP-GEF budget<sup>5</sup>. The objective of these additional efforts and inputs is to obtain a good price and confidence that the bidder can perform the works as proposed and on schedule. If the tender opening for the Invitation to Bid for the Pinyon and Hijborak sHPPs results in cost estimates that are too high for the Project budget or the capacity of the bidders is assessed to be insufficient to do the work proposed on the actual bid, completion of these sHPPs will be substantially delayed due to the need to re-tender the works after further inputs by the project engineers;
- considering the remote location of all sHPPs, provide additional coordination between the civil and electro-mechanical contractors to ensure the delivery of the equipment coincides with completion of civil works such as the powerhouse floor and draft tube;
- provide good communications with the heads of the jamoats of all communities where sHPPs are being constructed. This includes the Sorvo sHPP (currently being constructed) and the Pinyon and Hijborak sHPPs (slated for construction during 2015). It is envisioned that the jamoats will own and operate the new sHPPs, have personnel involved with its implementation as well as rural development activities that are integrated with the electricity delivered by the new sHPP;
- monitor quality of construction and equipment installation, obtain commitments from the contractors to address shortcomings, and provide construction progress reports; and
- ensure adherence to bid schedule or propose alternative scheduling in consultation with the jamoat heads.

<sup>4</sup> This includes Hijborak, Pinyon, Sorvo and Dashti-Yazgulom sHPPs, all of which are assumed to be completed by EOP. See Table 2.

<sup>5</sup> These efforts may consist of re-costing of the works by the project engineer, and a re-assessment of building material and fuel costs.

**Recommendation 2: Continue capacity building work with ER and KM workshops with a focus on:**

- Operation and maintenance of welding equipment. This is scheduled for February 2015 with possible additional workshop courses to be delivered at a later date. It is expected that welding best practices will be transferred to welders of ER and KM;
- Providing more site experience for these welders with new welding equipment;
- More integration of senior personnel at the workshops with “latent” experience in the manufacturing and assembly of SHP-related equipment. This should involve an assessment of these personnel to identify incentives for them to become more involved with ongoing workshop operations. If feasible, these personnel could serve as mentors for quality control and timely delivery of products coming from these workshops;
- Signing and honoring contracts for works to be provided for equipment supply; and
- Setup of a minimum of 2 remote workshops near other sHPPs for the purposes of supporting O&M of equipment

**Recommendation 3: Project approaches to provide O&M training for sHPP proponents should include existing sHPPs that were constructed over the past 20 years.**

These sHPPs were the subject of the December 2012 Parliamentary Hearings where it was reported that more than 50% of these sHPPs were not operational. If the Project has sufficient human and fiscal resources, the following actions could be taken with Komperg to bolster O&M activities during the remainder of the Project including:

- Have discussions with those who have undertaken the initial reconnaissance of the dysfunctional sHPPs, and prepare a short-list of 50 sHPPs for operational assessment and further action for O&M. The sHPP facilities with the highest benefit/cost (B/C) ratio or potential for electricity generation for the least cost should be prioritized;
- Undertake visits to approximately 15 sHPPs to generate reports for determining details of operational issues, measures to restore and sustain operations<sup>6</sup>, costs to restore, B/C ratio estimates, community readiness for O&M and action plans for restoration;
- Use these reports to train other sHPP Project proponents and their O&M staff on site as well as in regional technical institutes of the country. This training on best O&M practices at SHP facilities should include personnel from local jamoats, O&M staff, and vocational personnel;

It is important, however, to ensure that there are sufficient finances (either from the Project or from another source) to recruit an engineering team to undertake these assessments and training. If this recommendation is undertaken, it will be done without distraction from the importance of successfully completing the construction and operation of the 4 sHPPs mentioned under Recommendation 1.

**Recommendation 4: With \$1.4 million and 16 months remaining on the Project, a 15-month extension until June 30, 2017 is recommended for the following reasons:**

- With the annual construction window in Tajikistan being April to October, a 9-month extension will provide the Project another construction season in 2016 in addition to the one already scheduled for 2015;
- With an additional construction season and the current progress of preparation of the 4 remaining SHP projects to be developed, two sHPPs will have construction completed in 2015, and another 2 sHPPs under the LITACA Project, Jilikul and Shurobod, will be completed in 2016. This will meet the target of 5 operational sHPPs set by the Project PPM;

<sup>6</sup> This will include details of the design adjustments, repairs and routine maintenance for sustained operation of the sHPP.

- The additional construction year will provide an opportunity for the Project to deliver additional and needed technical assistance to civil contractors, the ER and KM workshops in the delivery of electro-mechanical equipment, and to GoT personnel in the consistency in application of the new RES Law and permitting of new sHPPs; and
- The Project will have sufficient time during 2017 to implement Component 4 and the proposed scale-up of small hydropower development in Tajikistan.

Approval of an extension is subject to two conditions:

- Submission of proof of commitments for capital funding under the LITACA Project (under the Government of Japan); and
- Submission of a work plan for 2015, 2016 and 2017 to demonstrate there are sufficient funds (from the Project and other sources if GEF funds are insufficient) for the completion of designs for the Jilikul and Shurobod sHPPs, the tendering process for civil contractors for these sHPPs, construction supervision and commissioning of the plants and their operation and maintenance.

**Recommendation 5: In consideration of the resources remaining on the Project, provide assistance to the Government (if there are sufficient resources) in the setup of the RE Trust Fund (or NTF). This assists the MoEWR in the strategic business planning of RES development. This will also inform potential financiers and donors to the Fund of the Government's financial requirements for developing SHPs over the next 10 or 20 years, and increase the likelihood of NTF capitalization.**

A strategic business plan for developing renewable energy sources in Tajikistan is required if there is to be any progress on setting up of the NTF. A general outline of the plan needs to cover the following issues:

- Background and forecast of energy demand and supply over the next 10 to 20 years;
- Listing of potential RE sites throughout the country;
- Strategic plan for development of RE projects and costs over the next 10 years to 20 years to minimize suppressed energy demand. This would also a re-structured Barki Tojik and approaches to include the private sector and more IRD-based projects to developing RE power generation projects;
- Capacity and institutional building requirements that would include technical and vocational training and training to government personnel for consistent application of the RES Law;
- Financial requirements based on strategic plan for development of RE projects, and identification of sources of funding for RE development in Tajikistan.

**Recommendation 6: The Project should revise its strategies to work towards its GHG reduction and energy generation targets:**

- The GHG target of “avoided GHG emissions from rural communities” energy use by EOP is 45 ktonnes CO<sub>2</sub>. The Project should count towards this target:
  - the GHGs from the 7 sHPPs supported on this Project as shown on Table 2;
  - the 5 sHPPs that have been co-financed by the GoT in the order of USD 4.4 million (as shown on Table 4); and
  - the sHPPs whose operations have been restored (pertaining to those sHPPs under Recommendation 3) only under the condition where there are sufficient funds (from the Project or other sources).

While the Project cannot change and will not likely meet the 45 ktonnes CO<sub>2</sub> reduction target by the EOP, this calculation will provide an estimate of the achievable GHG reductions by the EOP;

- The only “clear and measurable” energy generation target is the “annual electricity generation from newly installed sHPPs by EOP” which is 2,430 MWh/yr. This target should be calculated by:
  - the energy generated by the new sHPPs constructed under Table 2 which only reaches 1,472 MWh/yr assuming the current EOP date of April 1, 2016. With an extension to June 30, 2017, the annual energy generation will reach 2,786 MWh/yr, exceeding the 2,430 MWh/yr target through the operation of Jilikul and Shurobod sHPPs;
  - the energy generated from the 5 sHPPs that have been supported through GoT co-financing in the order of USD 4.4 million (as shown on Table 4); the annual energy generation of these 5 sHPPs is estimated to be 10,338 MWh/yr;
  - if Recommendation 3 of restoring dysfunctional sHPPs is implemented, the annual energy generation can also be added towards achievement of the target. This would require changing of the indicator to “annual electricity generated from new sHPPs and restored sHPPs”;
  
- The target in Outcome 3 of “number of SHP demos/pilots incorporating aspects of productive uses and livelihood support for host communities” should be revised according to what is achievable with remaining Project resources. Instead of a target of 10 demos/pilots, the target should be revised to 7 demons/pilots according to the list on Table 2.



# 1. INTRODUCTION

This report summarizes the findings of the Mid-Term Review (MTR) Mission for the UNDP-GEF project entitled “Technology Transfer and Market Development for Small-Hydropower in Tajikistan” (herein referred to as the “Project”) implemented by the United Nations Development Programme (UNDP) with financing support provided by the Global Environment Facility (GEF). The Midterm Review Mission for the Project was fielded to Dushanbe from November 24 – December 3, 2014. The midterm review timeframe of this report is April 2012 to November 2014.

## 1.1 Purpose of Mid-Term Review and Objectives

The purpose of the mid-term review (MTR) for this Project was to evaluate the progress towards attainment of global environmental objectives, project objectives and outcomes, capture lessons learned and suggest recommendations on major improvements. The MTR serves as an agent of change and plays a critical role in supporting accountability. As such, the MTR serves to:

- Strengthen the adaptive management and monitoring functions of the Project;
- Enhance the likelihood of achievement of Project and GEF objectives through analyzing project strengths and weaknesses and suggesting measures for improvement;
- Enhance organizational and development learning;
- Enable informed decision-making;
- Create the basis for replication of successful Project outcomes achieved to date;
- Identify and validate proposed changes to the ProDoc to ensure achievement of all project objectives; and
- Assess whether it is possible to achieve the objectives in the given timeframe, taking into consideration the speed, at which the Project is proceeding.

In accordance with UNDP/GEF monitoring and evaluation (M&E) policies and procedures, all projects with long implementation periods (e.g. over 3 or 4 years) are required to conduct MTRs. In addition to providing an independent in-depth review of implementation progress, the MTR is intended to be responsive to GEF Council decisions on transparency and better access to information during implementation.

The Project Document (ProDoc) provides details of the energy situation in Tajikistan:

- The deteriorating state of hydropower generation assets and the seasonal electricity shortages throughout the country; and
- The difficulties with the energy market in Tajikistan including suppressed energy pricing that form barriers towards its reform into a more viable sector.

The Ministry of Energy and Water Resources (MoEWR) under the Government of the Republic of Tajikistan (GoT) is the implementing partner of the Project.

## 1.2 Midterm Review Methodology and Scope

The scope of the MTR covers the entire Project and its components as well as the co-financed components of the project. This MTR assesses Project implementation taking into account the

status of Project activities, outputs and the resource disbursements made up to 30<sup>th</sup> November 2014. The MTR follows guidance provided from the UNDP-GEF office of 2014<sup>7</sup>. The guidance on the conduct of the MTR includes a review of:

- *Project strategy* that includes a review of the Project design, the Project planning matrix and the use of SMART<sup>8</sup> indicators and targets;
- *Progress towards results* that includes a review of the Project Tracking Tool and GHG emission reduction progress, a review of progress towards outcomes, and ratings of the achievements to date towards the Project objective and outcomes;
- *Project implementation and adaptive management* that includes a review of management arrangements, work planning, financing (both GEF and co-financing), M&E systems, stakeholder engagement, reporting and communications. All of these elements are critical in how the Project is implemented and adaptively managed. An overall rating is then applied to Project implementation and adaptive management; and
- *Sustainability*. Ratings are provided on against 4 GEF categories of sustainability: financial, socio-economic, institutional framework and governance, and environmental risks.

This MTR evaluates 31 months of the Project progress and achievements. The MTR team is to collect information and evaluate the Project through a review of relevant documents, interviews with the Project team as well as relevant stakeholders, and by reviewing and recommending actions to address capacity gaps and resources to meet targets. These efforts are summarized in Table 1. The MTR report will conclude with recommendations, as appropriate, for the key stakeholders of the project..

**Table 1: Summary of Efforts of the Midterm Review Team**

<b>Review Tier</b>	<b>Key Actions</b>
Macro level	<ul style="list-style-type: none"> <li>• Review of project documents and progress reports</li> <li>• Review relevant policies and programs/guidelines</li> <li>• Courtesy calls, meetings and interview with policy makers</li> <li>• Meetings and interviews with project staffs</li> <li>• Interviews with national level key stakeholders</li> </ul>
Meso level	<ul style="list-style-type: none"> <li>• Review targets in PPM and project accomplishments</li> <li>• Find out capacity gaps and resource needed to meet the targets</li> </ul>
Micro level	<ul style="list-style-type: none"> <li>• Meetings and interviews with stakeholders, program partners, and hydropower sector professionals, asking them if appropriate, on their satisfaction, benefits of participating in project and interacting with project team</li> <li>• Solicit opinions of beneficiaries and government officials whether the project linkages are working and are relevant and timely. If not what improvements could be done</li> </ul>

### 1.3 Structure of the Mid-Term Review Report

This MTR report is presented as follows:

<sup>7</sup> [http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance\\_Midterm%20Review%20\\_EN\\_2014.pdf](http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20_EN_2014.pdf)

<sup>8</sup> Specific, measurable, achievable, relevant and time-bound

- An overview of Project implementation from the commencement of operations in April 2012, including the developmental context of the Project, the problems that the Project is attempting to address, a brief description of the Project strategy, Project implementation arrangements, Project milestones, and a overview of stakeholders of the Project;
- Review of key findings of the MTR Project that includes reviews of the Project strategy and PPM design, the progress towards intended results of the Project, Project implementation and adaptive management, sustainability of the Project; and
- Conclusions, recommendations and lessons learned that can lead to increased probabilities of success.

## 2. PROJECT BACKGROUND AND DESCRIPTION

### 2.1 Project Developmental Context

The “Technology Transfer and Market Development for Small-Hydropower in Tajikistan” Project aims to improve the access to clean energy for Tajikistan. With an abundance of water resources and mountainous terrain, Tajikistan has an abundance of hydropower potential. However, despite this abundance, the country still experiences energy shortages for several reasons mainly due to high electricity demand in the winter mainly for heating and low hydropower generation in the winter, and increasing demand for conventional biomass and fossil fuels for power and other energy needs. Conversely, during the summer months, there is ample hydropower generation from spring and summer runoff producing an excess supply of electricity. In addition, Tajikistan is also highly reliant on hydropower, making it vulnerable to climate change. Changes in the snowpack that are affected by climate change will impact the country’s ability to generate hydropower as well as meeting water demand for other activities that are water intensive such as agriculture.

According to the Government of Tajikistan (GoT)<sup>9</sup>, the total installed capacity of hydropower generation facilities in the country is 4,873 MW that generates over 16.2 million MWh annually. Electricity deficits are experienced during the winter months in the order of 2.2 to 2.5 million MWh annually. These deficits are mainly experienced in the rural areas adversely impacting agricultural production. Conversely, there are electricity surpluses during the summer months in the range of 3.3 to 7.0 million MWh annually that lead to economic losses of USD 90 - 225 million annually.

As a means of increasing the availability of electricity to the rural sector, the GoT adopted a program of construction of small hydropower plants (sHPPs). GoT estimates that there are more than 900 micro to small hydropower sites with capacity of 100 kW to 3,000 kW for Tajikistan that are economically and technically feasible<sup>10</sup>. This would meet the energy demands of 500,000 to 600,000 people residing in rural and remote areas of Tajikistan. With an initial target of 189 sHPPs with a capacity of 103.6 MW, a total of 47 MW was developed during 2010 and 2011. In total, over 300 sHPPs have been developed in Tajikistan over the past 20 years through the use of several financial sources including the donor community, local investors and local communities.

There are unsubstantiated reports from several sources, however, indicating between 50 to 70% of these 300 sHPPs are not operational. The primary causes of non-operational plants appear to be the lack of water availability, poor engineering designs and the lack of maintenance. Furthermore, low electricity tariffs are not attracting investment into the Tajik energy sector, making improvements to power generation facilities and their transmission and distribution facilities more difficult.

Institutionally, the Ministry of Energy and Water Resources (MoEWR) provides the oversight on the energy sector in Tajikistan. The construction of new electricity generating facilities is the highest priority of the energy policy of which the construction of the 3,600 MW Rogun HPP is the top priority. The date of construction, however, is unclear; given the scale of Rogun, a start date earlier 2020 is unlikely.

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<sup>9</sup> <http://mfa.tj/en/energy-sector/the-energy-sector-of-rt.html>

<sup>10</sup> In Tajikistan, small hydro is classified as 1 to 30 MW installed capacity, 100 to 1,000 kW as mini hydro, and 1 to 100 kW as micro hydro.

With this focus on large hydropower development, notwithstanding the support for small hydropower (SHP) development, the development of SHP in Tajikistan clearly needs assistance to meet the country's medium to long term energy demands. The development of renewable energy sources (RES) for rural and remote areas of the country is high on the GoT's agenda. Given that there are no other sources of energy for rural and remote communities, Article 15 of the Law of the Republic of Tajikistan on Renewable Energy Sources states that "for promoting of RES medium and long term, interstate, national, sectoral and regional scientific and technical programs could be introduced, which will be planned in conjunction with the activities of energy supply in remote areas without sustainable energy..... implementation of these programs will be financed by the state budget and non-budgetary sources". The Energy Efficiency Master Plan for Tajikistan discusses the establishment of a National Trust Fund for RES and EE which in the short to medium term should focus primarily on providing financial support to electricity produced from community-based sHPPs.

The experience of Pamir Energy, an independent power producer operating in the Gorno-Badakhshan Autonomous Oblast (GBAO), provides some valuable lessons in the development of SHP projects in Tajikistan. Pamir Energy was established in 2002 by the Aga Khan Fund for Economic Development (AKFED) which currently owns 70%, in partnership with the International Finance Corporation (IFC) which has a 30% share. Pamir Energy was active in the rehabilitation of hydropower infrastructure and transmission lines in GBAO. The electricity costs of the poorest households were paid by a grant from the Government of Switzerland (GoS) via a trust fund. Following the improvement of electricity services in GBAO, additional financial support was leveraged from USAID, Roshan Company (part of the AKFED Network), and the Government of Norway to enable exports to neighboring villages in Afghanistan<sup>11</sup>. However, according to the unofficial information, in early 2014, the grant component funding was over after which Pamir Energy started experiencing financial problems. As of the summer of 2014, the GoS re-established the grant component. Pamir Energy's example clearly demonstrates that subsidies can be used as a temporary solution but they cannot guarantee sustainability if the conditions for power market operation remain unchanged.

## 2.2 Problems to be Addressed by the Project

The Project addresses problems in the development of SHP projects in Tajikistan including:

- the existing low tariffs do not provide full cost recoveries of new power plants even though there is existing legislation for the establishment of tariffs to ensure full cost recovery. This particularly affects the national utility, Barki Tojik (BT) that owns and operates the majority of hydropower and other power generation assets in Tajikistan, despite the fact that BT is nearly bankrupt;
- institutional capacity that currently is only able to address large hydropower development but does not have sufficient capacity for formulating strategic plans and managing a programme for SHP development;
- lack of a developed supply chain for locally produced SHP equipment. All SHP electro-mechanical equipment is now imported from Russia or China;
- lack of skilled workers with vocational skills required for constructing sHPPs as well as installation of SHP-related equipment; and

<sup>11</sup> <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:23143909~menuPK:141310~pagePK:34370~piPK:34424~theSitePK:4607,00.html>

- poor operation and maintenance of sHPPs.

## 2.3 Project Description and Strategy

The Project **objective** is to accelerate the development of small-scale hydropower (SHP) through:

- Outcome 1: Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country;
- Outcome 2: Enhanced technical and planning know-how and developed market chain for SHP;
- Outcome 3: Demonstrated technical and economic viability of SHP technology in supporting socio-economic development; and
- Outcome 4: National Scaling-up Programme of Renewable Energy-based Integrated Rural Development in supporting socio-economic development.

## 2.4 Project Implementation Arrangements

The Project is being implemented and executed by UNDP under guidelines for direct implemented modality (DEX) under UNDP's Energy and Environment Programme in close coordination with the Ministry of Energy and Water Resources (MoEWR)<sup>12</sup> and other government entities.

Under this arrangement, UNDP assumes the overall management and execution of the Project. MoEWR has appointed a National Project Coordinator (NPC) as the main Focal Point of the government contact with the Project. A Project Manager (PM) under the employ of UNDP manages the activities on a day-to-day basis.

## 2.5 Project Timing and Milestones

With the Project commencement date being April 1, 2012, the Project duration was set at 4 years with the terminal date of 31 March 2016. Milestones were set during the September 26, 2012 Inception Workshop with:

- completion of SHP guidebook for use by SHP project developers and government personnel by 2013;
- commencement of on-the-job training capacity building program for selected manufacturers in Tajikistan in 2013; and
- construction and commissioning of two pilot SHP projects by 2013 that uses 50% locally manufactured equipment.

Implementation of these pilot projects would then be left for the 2014 and 2015.

## 2.6 Main Stakeholders

The main Project stakeholders include:

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<sup>12</sup> MoEWR was formerly the Ministry of Energy and Industry at the commencement of the Project.

- Ministry of Energy and Water Resources (MoEWR) who serve as the main partner for this Project, with the mandate to develop energy generation sources for the country as well as managing the optimal use of water resources for energy generation, agriculture and human consumption;
- Ministry of Industry and New Technologies (MINT) who provide oversight of industrial developments in the country;
- Barki Tojik (BT) who are the state-owned utility with generation, transmission and distribution assets for the delivery of electricity to all Tajik households, businesses and industries;
- The Antimonopoly Service, amongst other mandates, implements state policies in the provision and approval of fair electricity tariffs in line with the protection of consumer rights;
- Ministry of Finance (MoF) who provide oversight to energy sector expenditures including subsidy payments from state budgets to regional budgets to support low income households, and funds to construct new power generation facilities including SHPs where sufficient information of the facility exists;
- Ministry of Economic Development and Trade (MoEDT) who provide oversight of country's economic development including those related to the energy sector;
- Local jamoats who have oversight of their rural development activities that are enhanced through the reliable supply of local hydropower;
- Local manufacturers and supply chain stakeholders of hydropower equipment;
- Donors such as ADB, WB, JICA, GIZ, IFC, SDC, and EBRD who are providing assistance to the GoT in the energy sector in both renewable energy and energy efficiency development; and
- NGOs such as the Association of Energy Professionals of Tajikistan and the Tajik-Norwegian Centre on SHP development that provide specialized or “think-tank” services to the GoT on strategic issues in the energy sector.

## 3. KEY FINDINGS

### 3.1 Project Strategy

This Project was designed to improve the living standards and quality of life through more concerted efforts to create a more enabling environment for the development of small hydropower plants (sHPPs) in rural areas of Tajikistan. UNDP has had involvement since 2006 in the development of renewable energy sources in Tajikistan as a foundation for supporting rural development and a basis for further sHPP developments throughout the country. In 2010, UNDP made investments into and implemented mini-hydro projects under a project entitled “Promotion of Renewable and Sustainable Energy Use for Development of Rural Communities in Tajikistan”. The outcome of this project has been the demonstration of the feasibility of providing reliable supplies of electricity to rural communities that were sufficient to support economic activities. These successes served as a basis for this Project, and sustained development of sHPPs for rural communities using best international practices.

The strategy of this Project as its title suggests was to strengthen local capacity for the development of sHPP projects throughout Tajikistan through transfer of sHPP-related technologies and the use of best international practices. This was to include tools to augment the current regulatory regime such as fair tariff determination and power purchase agreements; technology transfer related to the local manufacture of sHPP-related equipment from other developed countries; and building capacity for the use of best practices for designing, constructing, operating and maintaining sHPPs. This would create demand for locally-produced sHPP equipment and services, and increase the likelihood of sustained sHPP development.

The development of SHP in Tajikistan was not financially feasible as a private sector investment in consideration of the gaps in the legal and regulatory framework when the Project was commencing, the low tariffs for power generation development, and existing in-country capacity to develop and implement SHP investment projects. To overcome these issues, the Project deployed the unique approaches of coupling sHPP development with integrated rural development (IRD) activities and building local manufacturing capacity of the local supply chain for SHP-related equipment as possible means of sustaining sHPP operations and further development beyond the end of the Project (EOP). The Project design was to initiate institutional strengthening and capacity building for government agencies in the energy sector in Tajikistan, build local manufacturing capacity for local supply of SHP-related equipment, and support the construction and commissioning of pilot micro to small hydropower facilities, and a subsequent scale-up of SHP development throughout the country.

#### 3.1.1 Project Design

The Project design as provided in the 2011 ProDoc and updated in the Inception Report from October 2012 has 4 expected outcomes:

- Outcome 1: Adapted and enhanced legislative and regulatory framework for small-scale hydropower development. The activities to achieve this outcome were designed to have the Project serve a coordinating role in seeking to lower the barriers of a weak regulatory environment for the sale of electricity from sHPPs to Barki Tojik. This would include the lowering of barriers such as the lack of technical norms to the construction of sHPPs and their connections to the grid, lack of a standard methodology for the calculation of energy



generation from sHPPs, and the lack of power purchase agreement templates between sHPPs and Barki Tojik. The Project would revive the existing working groups consisting of an interministerial task force as well as the “Association of Energy Professionals”, whose members are parliamentarians and ministerial officials with authority to adapt and enhance the laws. The Project was also going to assist the GoT in the establishment of a National RES and EE Trust Fund for supporting RE projects. This would lower the barrier of the absence of a strong regulatory regime for SHP construction to larger-scale investments into sHPPs in Tajikistan;

- Outcome 2: Enhanced technical and planning know-how and developed market chain for SHP. Activities to achieve this outcome were designed to initiate capacity building of local entities to manufacture equipment for sHPPs in the range of 30 to 500 kW. The key challenge of this component was to find local workshops with some technological and maintenance experience with equipment related to hydropower plants, and to transfer intermediary SHP technology that could be locally manufactured at a cost affordable to sHPP proponents in Tajikistan. Activities to support this outcome were the preparation of an SHP development guidebook based on international standards, the involvement of local technical universities and colleges in delivering training to appropriate stakeholders and SHP professionals, technical assistance delivered by international SHP technology transfer providers to work with local manufacturing entities, and establishing a production line of locally produced heating and cooking devices for rural households. Without a strong local market for such electro-mechanical equipment, the capacity of local manufacturing of this equipment would remain weak necessitating the need for more costly international inputs;
- Outcome 3: Improved confidence on the technical and economic viability of integrated SHP-based rural development model. Activities to achieve this outcome were designed to support the full range of implementation actions required to develop a sustained SHP operation complete with rural economic activities. After an initial screening process, 5 communities were to be chosen to pilot an SHP-based rural development approach. The Project would support feasibility studies, integration of local socio-economic development plans, sharing of capital costs of an sHPP, awareness raising of required operation and maintenance activities of the sHPP, assistance to complete power purchase agreements with Barki Tojik, and assistance for the establishment of complementary economic activities at the rural level to create employment and energy demand. Micro-loans were also to be considered for these communities to catalyze economic activities;
- Outcome 4: National Scaling-up Programme of Renewable Energy-based Integrated Rural Development in supporting socio-economic development. This outcome was to be achieved through supporting the collection of information on the SHP-based IRD pilot projects, and disseminating this information to donors and other potential supporters and financiers. Through these means, scale-up plans can be formulated.

In summary, the Project design is similar to other GEF-supported small hydropower project designs (such as those in Georgia and Haiti) that address the lack of in-country capacity to implement and sustain SHP project developments under a less than attractive investment environment. The unique approaches of this Project, however, are:

- ⇒ the use of an integrated rural development (IRD) approach to sustain SHP development and operations. This approach was strengthened by UNDPs IRD pilot on the 200 kW Nurofar SHP project in the Burunov Jamoat near Vahdat that was started in 2009. The

Project then supported the design of a 375 kW unit in Sorvo to international standards to further demonstrate the feasibility of SHP projects in Tajikistan developed within an IRD framework. This would create demand for and ownership of sHPP assets apart from those developed by Barki Tojik, and sustain SHP development in rural areas of Tajikistan. However, due to the lack of financing, construction of 375 kW sHPP in Sorvo has not yet been implemented; and

- ⇒ building of local capacity for the manufacture of SHP-related equipment. To the knowledge of this Evaluator, this has not yet been attempted in other countries for small hydropower projects. While most owners of small hydropower technology would prefer to supply and install equipment, this Project focused on the transfer of SHP technology manufacturing know-how and installation to another country. As such, challenges were expected in sourcing potential development partners with appropriate SHP technology who would be willing to assist in the start-up of local manufacture of their technology.

No significant gender concerns were considered on the design of this Project.

### 3.1.2 Results Framework

The October 2012 results framework for the Project can be found in Annex D. The Project PPM was originally designed in 2011 and updated in October 2012 during the Inception Phase, consisting of 4 components.

A general overview of the PPM is provided:

- Project goals include GHG reduction targets, both direct and during the 10-year influence period after the EOP. There are two issues with this target:
  - The direct GHG reduction target of 45,000 tonnes CO<sub>2eq</sub> by the EOP<sup>13</sup> was based on the assumption of 10 operational sHPPs with the total installed capacity of 2.5 MW to be supported by the Project; the Project is currently developing just 7 sHPPs with 0.67 MW of total capacity plus there are an additional 5 sHPPs being co-financed by the GoT. In addition, there is also the 244,000 tonnes CO<sub>2eq</sub> target that assumes GHG reductions from 27 operational sHPPs that is cumulative over the 10-year GEF influence period after the EOP; based on what the Project and GoT are currently developing this does not appear to be achievable. The basis for these original GHG targets were baseline assumptions of energy consumption in each community that were simplified to an on-grid emissions factor during the summer (when there is an abundance of water and hydropower) and an off-grid emissions factor during the winter (when runoff and hydropower are scarce and replaced by diesel at 50% and by fuel wood at 50%). The Project had undertaken surveys of baseline energy consumption (to support IRD efforts) which were used to determine more realistic baseline emission factors of each community where sHPPs are being constructed. *This approach yielded a considerably lower emissions factor that accounts for the overestimation of the GHG targets<sup>14</sup> mainly due to the finding that the surveyed communities used considerably less diesel than the original assumption of 50%.* Applying these new energy emission

<sup>13</sup> The direct GHG target of 45,000 tonnes CO<sub>2eq</sub> was reduced from 90,000 tonnes CO<sub>2eq</sub> during the Inception Phase in October 2012.

<sup>14</sup> This approach included surveys of each community of the annual usage of various fuels and energy sources including electricity from sHPPs, solar PV panels, coal, diesel and wood. The usages were then weighted to determine an “energy emissions factor” for each off-grid community. For the off-grid sHPPs, energy emissions factors were 0.353, 0.285 and 0.299 kg CO<sub>2e</sub>/kWh for Sorvo, Dashti-Yazgulom and Nurofar respectively.

factors to the 7 sHPPs being supported by the Project and 5 sHPPs that have been recently completed under the GoT, the annual GHG emission reductions from the Project are in the order of 346 tonnes CO<sub>2eq</sub> for on-grid sHPPs, and 1,651 tonnes CO<sub>2eq</sub> for off-grid sHPPs. This rate of GHG reduction generation cannot reach the actual EOP target of 45,000 tonnes CO<sub>2eq</sub>. Furthermore, the annual GHG reductions of these sHPPs of 1,997 tonnes CO<sub>2eq</sub> would translate into a lifetime GHG reduction of 59,910 tonnes CO<sub>2eq</sub> (assuming 30-year lifetime of a sHPP) that would not meet the lifetime direct GHG target of 244,000 tonnes CO<sub>2eq</sub>;

- The 45 ktonnes of direct CO<sub>2eq</sub> emission reductions were also to be achieved within the original Project period of 45 months. This did not appear to be realistic, firstly, considering that at least one year would be required to develop, adopt and implement enabling policies and regulatory framework to encourage sHPP investment. Secondly, there is the challenge of developing sHPP sites in remote locations using local stakeholders whose knowledge of sHPPs are strengthened through transfer technology and exposure to best international practices which would also require at least one or two years. Thirdly, there is the challenge of developing sHPP projects in remote locations with a limited construction season window (mainly from April to October) when most construction activities take place which may add one or two years to implementing these sHPP projects. Given these issues, the Project period should have spanned a minimum of 5 construction seasons that would increase the probabilities of a sufficient number of sHPPs to be completed and generating GHG reductions;
- Objective indicators include the number of pilot SHPs to be developed under the IRD model along with accompanying electricity generation targets. These are tied to the GHG reduction targets. The wording of some of the energy generation targets, however, requires more clarity regarding the energy saving targets, if they are either annual or cumulative;
- Outcome 1 provides indicators for two outputs, one on enforced rules and regulations for the new RES Law, and the other on the institutional strengthening of local and national government agencies to coordinate and develop SHP projects. The outputs and targets are clear. However, the target of an operational National Trust Fund (NTF) should be reviewed given that the MoEWR will establish the NTF by mid-2015 but without any capital. As such, the fund in this state cannot be considered operational. Instead, the Evaluator is requesting that the EOP target be revised to a RE strategic development plan; such a plan would be of assistance to the Government to attract capital from donors and other sources by the EOP. This is further discussed in Table 1 under Output 1.1, and Section 4.1: Conclusions and Section 4.2: Recommendations;
- Outcome 2 provides indicators for 4 outputs related to the production of a guidebook on SHP development, development of a technology transfer and capacity building plan for selected local manufacturers, number of technicians receiving vocational training on SHP, and number of workshops setup for the local manufacture of simple heating and cooking devices for rural households. All outputs and targets are clear and achievable, and should lead to the desired outcome of strengthening of the local supply chain for SHP-related equipment. There are two issues of concern, however, given the progress of the Project to date:
  - The vocational training program (Output 2.1) focuses mainly on equipment manufacture and installation. Additional focus will be needed for equipment and plant maintenance at the Jamoat level which output currently does not provide adequate coverage given the current focus on installation of sHPPs;

- The local manufacture of hybrid biomass-electric heaters in Tajikistan (Output 2.4) would not be competitive against similar heaters from China that are available in Tajikistan. The Project needs to reset this target on the type of products that could be locally produced such as non-electric EE heating and EE cook stoves;
- Outcome 3 provides indicators for number of feasibility studies, IRD plans, projects in the pipeline, operational sHPPs at the EOP, PPAs signed at the EOP and local businesses supported by the pilot sHPPs. The indicators and targets are clear and achievable towards the desired outcome of improved stakeholder confidence on the technical and economic viability of integrated SHP-based rural development model. The target of 10 “SHP demos/pilots incorporating aspects of productive uses and livelihood support for host communities” will not be achieved, however, given that there will only be 7 sHPPs constructed by the EOP. A re-setting of this target or the changing of the strategy to achieve this target is required, and is further discussed in Recommendation 6 in Section 4.2;
- Outcome 4 provides indicators for the reports on Projects results and lessons learned, number of conferences on RE-based IRD projects, and level of Government incentive allocations to support SHP development. The indicators and targets of this outcome are clear and achievable to facilitate the scale-up of sHPP development in Tajikistan.

In conclusion, the quality of the PPM is satisfactory with most indicators meeting SMART criteria, and adequately serving as a useful tool for managing this Project.

## 3.2 Progress towards Results

This section provides a review of the actual progress made in the 31 months of Project operations from April 2012 to November 2014.

### 3.2.1 Progress towards Results

Details of Project progress towards outcomes, objective and goal can be found on Table 1 with the colour-codes<sup>15</sup>. Highlights and issues of this progress are summarized as follows:

- Project goal of 244,000 tonnes CO<sub>2eq</sub> of lifetime GHG reductions (30 years service life for a sHPP) is *unsatisfactory* due to the fact that the target cannot be achieved due to a scale-back in the number of sHPPs to be developed on this Project from 27 to 10 sHPPs, and assumptions made in the ProDoc that overestimated the use of diesel in the baseline;
- The Project objective of significantly accelerating sHPP development through the removal of various barriers has been *moderately satisfactory*. One issue has been the slow progress of sourcing appropriate technical assistance for capacity building of the local workshops for manufacturing sHPP-related equipment;
- On Outcome 1, Project resources utilized to assist the MoEWR and Barki Tojik with the amendments to rules and regulations to implement a new law on “renewable energy sources” (RES Law) has been *moderately satisfactory*. The RES Law will:

<sup>15</sup> These are prescribed by UNDP-GEF MTR reporting criteria

**Table 1: Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)**  
**Indicator Assessment Key**

Green= Achieved      Yellow= On target to be achieved      Red= Not on target to be achieved

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
<b>Goal:</b> Reduction of GHG emissions from energy use by rural and remote communities	<b>Achievement Rating: 2 (Unsatisfactory):</b> The target for sHPPs was scaled back during the Inception Phase from 27 to 10 sHPPs to the current number of 7 sHPPs based on anticipated delays in building local manufacturing capacity. Despite this scale-back and additional crediting of 5 sHPPs financed and developed by the GoT, annual GHG emission reductions developed during the Project are in the order of 346 tonnes CO <sub>2eq</sub> for on-grid sHPPs, and 1,651 tonnes CO <sub>2eq</sub> for off-grid sHPPs (see Table 2 for details). Given that these annual GHG reductions will only be generated for less than 2 years (until the current EOP date of April 1, 2016), the actual EOP target of 45,000 tonnes CO <sub>2eq</sub> cannot be achieved. Furthermore, the annual GHG reductions of these sHPPs of 1,997 tonnes CO <sub>2eq</sub> would translate into a lifetime GHG reduction of 59,910 tonnes CO <sub>2eq</sub> (assuming 30-year lifetime of a sHPP) that would not meet the lifetime direct GHG target of 244,000 tonnes CO <sub>2eq</sub> .							
	Avoided annual GHG emissions from rural communities' energy use by end of project (EOP), ktCO <sub>2</sub> /year	0			45	1.84		GHG estimates of direct emissions by EOP is 1,839 tCO <sub>2</sub> based on 2 sHPPs (Dashti-Yazgulom and Nurofar) that have been completed with involvement of the Project to date with the IRD, capital cost and implementation support (Outcome 3) <u>plus</u> the 5 sHPPs completed under GoT financing and development. See Table 2 for a summary of sHPPs included in this estimate.
	Avoided GHG emissions from rural communities' energy use by end of project influence period, 10 years (EOPIP), ktCO <sub>2</sub>	0			244	18.4		Based on annual GHG reductions from 2 sHPPs (supported by the Project) and 5 sHPPs (supported by the GoT) that have been completed by EOP <sup>16</sup> .
<b>Objective:</b> Significantly accelerate the development of small-scale hydropower (SHP) by removing barriers through enabling legal	<b>Achievement Rating: 4 (Moderately Satisfactory):</b> There has been moderately satisfactory progress in the removal of legal and regulatory barriers as well as capacity building for government personnel and personnel to accelerate the development of SHP. Capacity building for local workshops in Tajikistan involved in the supply chain for electro-mechanical equipment is progressing slowly due to initial problems sourcing appropriate technical assistance for the Project. There is a minor issue with the need for some clarity on the indicators for electricity generation of newly installed sHPPs. The outcome of these activities, however, has led to 50% of the sHPP power generation targets being met after 31 months of Project activity.							

<sup>16</sup> This only includes sHPPs that have been completed to date including 2 sHPPs supported by the Project and 5 sHPPs supported by the GoT that were completed in 2013 and 2014 with the benefit of technical assistance from the Project. See Table 2 for details.

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
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.	No. of new small hydropower projects under implementation by EOP	1			10 <sup>17</sup>	14		Five sHPPs are now under implementation with Project support with another 9 sHPPs with confirmed financing under GoT and private financiers. See table 2 for more details.
	Minimum No. of fully operational sHPPs by EOP	0 <sup>18</sup>			5	1		The completed project was the 15 kW sHPP in Dashti Yazgulam settlement of Vanj district that was commissioned in May 2014. This sHPP project was inherited from a UNDP/EU project, Border Management Control in Central Asia (BOMCA) in late 2012. Two sHPPs will be constructed in 2015, Pinyon and Hijborak (100 kW each) with Sorvo (30 kW) currently under construction. Agreements are in place for LITACA funds (from the Japan Government) to provide capital finance for Jilikul and Shurobod sHPPs. The date for their construction and completion, however, will not be during this Project with its current terminal date of March 31, 2016
	Cumulative Annual-electricity generation from newly installed sHPPs by EOP, MWh/yr	0			2,430	1,472 <sup>19</sup>		There is some confusion over this indicator. The number of 2,430 MWh/yr should be “annual electricity generation from newly installed SHP”. Annual generation target will not be achieved with only 4 sHPPs likely in operation by the EOP date of March 31, 2016. Strategy to achieve annual generation target should be reviewed

<sup>17</sup> The projects are in various stages of development (assessment , feasibility, construction, operation)

<sup>18</sup> Many SHP constructed in the past are malfunctioning; none connected to the grid and few investments in SHP take place, except for by isolated donor-funded projects

<sup>19</sup> This includes Hijborak, Pinyon, Sorvo and Dashti-Yazgulom sHPPs, all of which are assumed to be completed by EOP. See Table 2.

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
								that could incorporate inclusion of GoT-support sHPPs (see Table 2). This could bring MTR assessment of annual electricity generation to 11,810 MWh/year.
	Cumulative electricity generation from newly installed SHPs by EOPIP, MWh/yr	0			6,500	Unable to assess due to lack of clarity of the indicator		There is some confusion over this indicator with the previous one. The indicator of “cumulative electricity generation from newly installed SHP by EOPIP” implies electricity generated during the influence period of 10 years. However, the target of <u>6,500 MWh</u> implies cumulative generation to EOP. If this is correct, the Evaluator recommends removal of this target since the indicator “Annual electricity generation from newly installed sHPPs by EOP” is adequate for monitoring project progress.
<b>Outcome 1:</b> Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country	<b>Achievement Rating: 4 (Moderately Satisfactory):</b> Achievement of this outcome is characterized by a) Substantial progress from the Project work on simplified procedures for the licensing and construction of sHPPs, adoption of the tariff methodology calculation, and the adoption and operationalization of the RES Law by 2013; b) Training for government personnel on the application and processing of the RES Law for new sHPPs; and c) Legal basis for a National Trust Fund for Renewable Energy (NTF) formed with the new Energy Efficiency and Energy Saving Law. Progress on capitalization of the NTF, however, has been stalled due to the lack of a strategic plan for RE development, no stated purpose of the Fund, and the consequent reluctance of donors to capitalize the NTF.							
	Adopted regulation operationalizing RES Law	No regulations in support of RES Law		Rules and regulations adopted by end of Year 1		Adopted in Year 2		Rules and regulations on “renewable energy sources” adopted in Year 2 including rules for the development of the tariff calculation methodology creating a better understanding amongst SHP investors on the methods of tariff calculation
<b>Output 1.1:</b> Formulated, approved and enforced implementing rules and regulations (IRRs) of the new Law for RES that will facilitate actions geared towards the enhancement of the market environment for	Simplified procedures and principles for the licensing and construction of SHP facilities	RES Law includes a number of provisions to facilitate investment in grid-connected RE projects,		Procedures adopted by end of Year 1		RES Law adopted and operationalized		Law on RES was adopted in September 2010 and operationalized through its application on the purchase of excess power from individual power producers by the national electricity utility “Barki Tojik”.

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
SHP		but they are not operationalized						
	National RE/EE Fund	National RE/EE Fund		National RE/EE Fund (or NTF) set-up and is operational by end of Year 2	EOP target needs to be reset	Not yet operational		The adoption of the Energy efficiency and Energy Saving Law in September 2013 created the legal merits for establishment of the NTF for Renewable Energy (RE) and Energy Efficiency (EE). Its operation, however, is in doubt given that there are no expressions of interest to capitalize the fund. This is likely due to the lack of a strategic plan for RE development, and no stated specific purpose for the NTF.
<b>Output 1.2:</b> Central and local government institutions with enhanced capacities to develop and coordinate SHP projects	# staff members from relevant central and local government institutions trained in developing and coordinating SHP projects	0		30		30		Training was for government officials from the MoEWR, Ministry of Economic Development and Trade, Ministry of Finance, Agency for the Antimonopoly control, Barki Tojik, and Ministry of Justice. Prior to the training, a capacity needs assessment was completed on which the content of the training modules was developed. Topics covered were on application of all laws, policies and regulations to promote RE sources, and small hydropower in particular. The modules covered such topics as the existing legislation and the regulatory framework in support of the renewable energy sector, law implementation mechanisms, the energy situation in the country and perspectives that renewable energy offers for reducing the burden of energy demand from the traditional energy sources.



Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
<b>Outcome 2:</b> Enhanced technical and planning know-how and developed market chain for SHP in Tajikistan	<b>Achievement Rating: 4 (Satisfactory):</b> Achievement of this outcome are characterized by a) Timely completion of SHP development modules for use by SHP financiers and developers in Tajikistan; b) Timely introduction of the SHP development modules in the education system through the Tajik Technical University and the Tajik Energy Institute in Kurgantyuube; c) Selection of two local manufacturing entities for the purposes of building their capacity for manufacturing electro-mechanical equipment for sHPPs; d) Development and implementation of capacity development plans for technology transfer by Komperg, a Croatian company for manufacturing of turbines and other equipment for sHPPs that took one extra year due to difficulties in sourcing this type of expertise (i.e. a technology company willing to share if technology and have it manufactured in a developing country); e) Delayed vocational training for SHP operational entities in the design, construction and O&M of sHPPs; f) Efforts to build capacity of local manufacturers for production of electric and biomass heaters has been stalled due to the flooding of the Tajik market with less costly heating equipment.							
	% of the total SHP installed cost provided by locally made goods and services	5-10			50	To be determined		Studies on the actual cost of local production as a % of total capital cost still need to be completed.
<b>Output 2.1:</b> Guidebook on technical and policy aspects of SHP project development (to be used in all trainings to be delivered by the project)	Guidebook on SHP project development	0		1 <sup>20</sup>		1		Project also supported development of SHP education modules by specialists from local technical universities, MoEWR and Association of Energy Specialists of Tajikistan. These modules, consisting of 12 chapters introducing small hydropower in Tajikistan, were approved by academic councils of the Tajik technical university and the Kurgan Tyube Energy Institution for introduction of these modules into the education curricula.  Informal beneficiary consultations revealed that general workers would like to have better technical knowledge on SHP electromechanical equipment.
<b>Output 2.2:</b> Local workshops and manufacturers with enhanced capacities to	Technology transfer and capacity development plan	0		2 <sup>21</sup>		2		Two capacity development plans were prepared and the terms of reference for technology transfer developed. This resulted in the

<sup>20</sup> End of Year 1

<sup>21</sup> End of Year 1

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
install, construct, manufacture and repair SHP system equipment and components	prepared for selected local manufacturers							<p>selection of "Komperg", a Croatian company in October 2013 to provide technology transfer. A capacity assessment of the technical capabilities of local manufacturers was developed in January 2014 resulting in a list of two eligible companies: the "Korgohi Mashinasozi" plant (KM) and the "Energoremont" Plant (ER). They have both produced the first portable turbines with their existing equipment and machinery and local personnel. An on-the-job training course for the students from the Technical university was organized using the "Korgohi Mashinasozi" plant (KM), where the students had a chance to observe the process of production for portable turbines. The Tajik Technical University (TTU) is now closely cooperating with KM for on-the-job training at the factory.</p> <p>In October 2014, the Project through Komperg, identified and procured additional equipment for KM and ER to improve their manufacturing ability, including a high power welding machine and precision sheet metal cutting equipment.</p>
<b>Output 2.3:</b> Vocational training program for technicians involved in SHP design/ construction and O&M	# of technicians annually undertaking vocational training on SHP	0		20		7		<p>During Year 2 (2013), 7 employees of "Dehoti Obod", operator of sHPP "Nurofar" in Burunov Jamoat, received vocational training on small hydropower maintenance, operation and management, providing a solid foundation for personnel to independently operate and provide general maintenance of the hydropower plant. A limitation of this training, however, is the lack of</p>

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
								coverage need for complex equipment maintenance; in this instance, Jamoats would need to call specialized companies for such maintenance; however, they mostly refer to ER for such services
<b>Output 2.4:</b> Local manufacturers capable of producing combined electric and biomass-fired heating and cooking devices for rural households	# of local craft workshops capable of manufacturing and assemblage of simple, efficient and low-cost electric heating and cooking devices	0			1 <sup>22</sup>	0		A Project study on the viability of producing the combined electrical and biomass fired heating and cooking device indicates that production of the devices locally will not be sustained: a) Local power supplies of 1 kW will not be sufficient to operate the device reducing its demand; and b) limited demand for these devices is expected due to the flooding of less expensive Chinese goods. A reset of this target is required that may include the introduction of a non-electric energy efficient heating and cooking furnaces that were successfully demonstrated under the GEF SGP projects in Tajikistan.
<b>Outcome 3:</b> Improved confidence on the technical and economic viability of integrated SHP-based rural development model	<b>Achievement Rating: 5 (Satisfactory):</b> Achievements of this outcome are characterized by a) Prefeasibility studies were prepared for 27 sites from which 10 sites were selected for feasibility studies and possible development; b) District development plans completed; c) Successful activities to bring the community-owned sHPP in Burunov jamoat to operate on a sustainable basis. Subsidies have recently been removed from the operations of this sHPP; there is a signed PPA between the sHPP management team and Barki Tojik for the sale of excess electricity to the national grid; there was support for the development of a mini-dairy by the Burunov jamoat that used the electricity from the sHPP. A minor issue exists with the target of 10 communities for SHP demos/pilots that incorporate IRD approaches. This target should be re-adjusted.							
	No. of SHP demos/pilots incorporating aspects of productive uses and livelihood support for host	0			10 <sup>23</sup>	1		The Nurofar sHPP pilot has provided valuable information on IRD and the creation of economic benefits from the reliable supply of electricity to a community. Two more sHPP projects (Pinyon and Hijborak, each 100 kW) with capital costs support by the

<sup>22</sup> By end of Year 3 depending on the results of market and feasibility analysis the workshop may or may not be created. The Chinese goods are highly competitive in the local markets.

<sup>23</sup> This includes 5 community-owned SHP projects operating on a sustainable basis and 5 additional projects under construction

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
	communities							Project are slated for construction in 2015. Two additional sHPP projects with capital funding from JICA are slated for construction in 2015 also (Jilikul and Shurobod). It is highly unlikely that the target of 10 SHP pilots will be achieved due to lack time to complete the target number of sHPP sites. The target may not need to be reset if GoT-supported sHPPs are counted and if there is a Project extension that will allow completion of the JICA-funded sHPPs.
<b>Output 3.1:</b> Technical studies, political commitments and institutional framework secured for pilot SHP projects	Feasibility studies	0		5 <sup>24</sup>	10 <sup>25</sup>	25		The prefeasibility studies completed for 27 sites from the “National Strategy for Construction of sHPPs for 2009 - 2020” have revealed that only 10 are suitable for construction of sHPPs. The Project presented these findings to the national stakeholders at a round table organized by MoEWR resulting in 5 feasibility studies being provided to Komperg in late 2013 for sHPP engineering designs. This includes Sorvo (currently being implemented), Pinyon and Hijborak (slated for 2015 construction) and Jilikul and Shurobod (scheduled for 2016, after current EOP date of March 31, 2016). There are also another 25 SHP sites on irrigation canals as studied under EBRD assistance.
	Number of integrated district development	0		2	5 <sup>26</sup>	5		The district development plans on integrated rural development for 5 target areas has been reviewed. Each district has plans that are updated on

<sup>24</sup> 2 studies in Year 1, 3 more in Year 2

<sup>25</sup> 5 additional studies done by Year 3

<sup>26</sup> 3 additional IDDPs by Year 3

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
								an annual basis). This includes the budgetary and non-budgetary allocations towards the construction and rehabilitation of the vital district infrastructure like roads, hospitals, schools and kindergartens, electricity and water supply systems.
	Number of SHP projects in the pipeline	0			5 <sup>27</sup>	10		GoT reports that there 10 sHPPs in the pipeline as detailed on Table 2 (estimated investment cost of USD 44.2 million). They also report that 5 sHPPs (1.967 MW) have been completed in 2013 and 2014 through Government and the private investors at an estimated investment of USD 4.4 million, and that the benefit extends to at least 1,000 households who have improved their access to energy, and 130 people have employment of which 35 are women.
<b>Output 3.2:</b> Operational SHP demos/pilots in selected communities, demonstrating the viability of the technology and O&M&M models	No. of operational demo/pilot SHP plants by EOP	0			5	2		Nurofar sHPP is a community owned sHPP in Burunov jamoat of Vahdat town that operates on a sustainable basis. The sHPP with 200 kW of installed capacity was constructed and feeds electricity to 60 households, as well as to the local school, kindergarten, hospital and a mini-dairy processing shop. The plant is on the local jamoat's balance sheet; however, in view of its limited capacity to maintain and operate the small hydropower plant, a limited liability company "Dehoti Obod" was created to provide maintenance, management and operation services, including fees collection. The estimated annual electricity generated by the plant is 1,051 MW/h/year.

<sup>27</sup> At least 5 further SHP projects identified and construction started (without direct project support)

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
								Construction of the Dashti Yazgulom small hydropower plant was completed in June 2014. The capacity of the plant is 15 kW that produces 87 MWh of electricity annually. The SHP was originally planned under the UNDP/EU BOMCA project, and was constructed to support the Tajik-Afghan border outpost in Vanj district.  The completion of sHPPs at Sorvo, Hijborak and Pinyon by EOP will be key to meeting this target.
<b>Output 3.3:</b> Pilot SHP operations sustained	Number of PPAs signed for purchase of power from pilot SHP plants by EOP	0			2 <sup>28</sup>	2		Nurofar SHP management has made 2 contracts with local small businesses to sell excess energy for comparatively cheaper price than from the national grid during the summer time. The price for entrepreneurs and businesses from the grid is USD 0.06 (or 0.31 TJS) whereas the SHP provides the electricity for USD 0.04 per kWh. This measure allows the SHP to operate sustainably throughout the year.
	Number of local business supported in pilot localities	0			5	2		1 local business, a mini dairy processing workshop with capacity to process 500 liters of milk per day was supported in Burunov municipality where the "Nurofar" SHP is constructed. The produced dairy products are very popular locally and the workshop is not able to meet demand.
<b>Outcome 4:</b> National Scaling-up Programme	<b>Achievement Rating: Cannot rate due to insufficient progress.</b> There is progress on all outputs with the expectation that the outputs will be achieved by EOP.							

<sup>28</sup> End of Year 3

Project Strategy	Indicator	Base-line Level	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target	End-of-project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
of Renewable Energy-based Integrated Rural Development	Adopted and financed National Scaling-up Program	NA			Adopted and financed National Scaling-up Program	In progress		Activities are in progress and expected to be met by the current EOP date of April 1, 2016
<b>Output 4.1:</b> Project results assessed, analyzed and compiled into comprehensive national report	Project results and Lessons learnt report	NA			1	0		A case study of integrated rural development (IRD) in Burunov jamoat titled “Socio-Economic and Environmental Benefits of Small Hydro Power in Tajikistan: Evidence from Burunov Community” was prepared. A thorough analysis of the SHP based IRD is made that presents a template for application and scaling up of the IRD model. The study was initiated as a step to demonstrate the viability of the IRD model.
<b>Output 4.2:</b> Knowledge sharing products developed on best practices	Conference on integrated renewable-energy based rural development	NA			1	0		Conference is planned for early 2016
<b>Output 4.3:</b> Approved and funded proposal for national scaling up of the SHP demos/pilots	Annual amount of governmental incentives allocated to support investment in new SHP plants under the scale-up plan by EOP, in USD	0			4,400,000			The number of sHPPs constructed and commissioned by the public and private investors in Tajikistan during 2012 and 2013 is 23 with a total capacity of 3.74 MW, out of which 6 plants were financed by GoT. Total investment of the 23 sHPPs is USD 6.4 million (or TJS 32 million). These sHPPs have provided access to electricity for nearly 3,000 households across Tajikistan and employment for nearly 500 persons. There are, however, unsubstantiated reports that several of these sHPPs are not operating or fully functional. Additional assistance is required to provide more emphasis on O&M of sHPPs

**Indicator Assessment Key**

Green= Achieved

Yellow= On target to be achieved

Red= Not on target to be achieved

- permit Barki Tojik to purchase of electricity from an independent power producer (IPP) such as LLC Dehboti Obod, operator of the 200 kW Nurofar SHP at Burunov Jamoat. UNDP Tajikistan and the Project had been supporting the Jamoat with an SHP-based IRD project “Scaling up of Area Based Integrated Rural Development” from 2009 to 2011;
- streamline existing procedures for the licensing and construction of SHP projects; and
- provide the legal basis for the establishment of a National Trust Fund (NTF) that will serve as a pool of financing resources for all investments into RES and EE development.

The issue, however, is likelihood of not achieving the target of a fully operational and capitalized NTF for which no sources of capital have yet been identified. Without a definition of how the funds in the NTF will be utilized, donors are reluctant to capitalize such a fund;

- On Outcome 2, satisfactory progress was achieved in the building of local capacity for SHP development. Activities included the development of an SHP guidebook, identification of local manufacturers to build capacity, and working with them to manufacture, install and repair SHP equipment and appurtenant components;
- On Outcome 3, satisfactory progress has been achieved with the technical and economic viability of SHP-based rural development models that were demonstrated with the aforementioned SHP-IRD model in Burunov Jamoat. This has provided confidence to future investors that the SHP operations can be sustained in Tajikistan;
- On Outcome 4, there has not been sufficient progress to merit a progress rating for the National Scaling-up programme for RE-based IRD. The case study of the Burunov jamoat IRD with the development of SHP for the community has been prepared. In addition, the GoT reports that USD 6.4 million was expended on 6 sHPPs (total installed capacity of 3.74 MW) during the 2012-13 period. A conference to share the findings of this Project is proposed for early 2016;
- A number of challenges have been encountered during implementation of the Project:
  - Progress on the establishment of the “National Trust Fund” for RE and EE (Output 1.1) has encountered issues regarding a weak design and donor reluctance for its capitalization. These issues are further discussed in Section 3.3.1;
  - Delays were encountered in the identification and contracting of a suitable company to provide technology transfer services and designs for pilot sHPPs. The issue was an initial lack of interested companies that resulted in the loss of 2013 in terms of preparing designs for 5 sHPP pilot projects (Output 3.1), and delays in technology transfer activities to local workshops (Output 2.2);
  - Delays in the completion of the micro 15 kW hydropower project “Dashti Yazgulam” due to unsatisfactory quality of the constructed works. This included the powerhouse not complying with the original roofing and wall insulation designs, and delays until early 2014 to complete pressure testing of the intake pipe to the powerhouse which were duly addressed to complete the sHPP; and
  - Delays in the start-up of local manufacture of electric and biomass-fired heating and cooking devices for rural households (Output 2.4) due to flooding of the Tajik market with cheap goods;
  - Direct GHG reduction targets are not going to be met due to their overestimation in the ProDoc. Reasons for the high estimates include:
    - ⇒ The original estimate being based on the assumption of 27 SHPs with total installed capacity of 2.5 MW to be supported by the project, compared with only 7 SHPs with 0.67 MW of total capacity currently facilitated by the Project plus 5 sHPPs financed and developed by the GoT;



⇒ An assumption that off-grid sHPPs use 50% diesel fuel and 50% wood fuel for energy in comparison to actual baseline energy surveys which indicate more than 80% of the energy needs are serviced by wood fuel. As such, actual off-grid sHPP emission factors are far less than those assumed in the ProDoc.

Table 2 provides key data on the pilot sHPPs and co-financed sHPPs that are generating GHG reductions from knowledge products and technical assistance from this Project.

**Table 2: Key data on the sHPPs developed during Project**

SHP	Expected commissioning, year	Installed capacity, kW	Net electricity output, kWh/year	Grid connection status	Grid or energy emission factor (kgCO <sub>2</sub> /kWh) <sup>29</sup>	Expected annual GHG reduction (tonne CO <sub>2</sub> )
<b>Pilot sHPPs supported by Project:</b>						
1. Hijborak	Late-2015	100	525,600	on-grid	0.04	21
2. Pinyon	Late-2015	135	709,560	on-grid	0.04	28
3. Jilikul	Late 2016	75	394,200	on-grid	0.04	16
4. Shurobod	Late 2016	175	919,800	on-grid	0.04	37
5. Sorvo	Mid-2015	30 (2 x 15)	157,680	off-grid	0.353	56
6. Dashti-Yazgulom	Since June 2014	15	78,840	off-grid	0.285	11
7. Nurofar <sup>30</sup>	Since April 2012	200	1,051,200	off-grid	0.3	315
<b>sHPPs supported through GoT Co-Financing<sup>31</sup>:</b>						
8. Shirkent-2	2013	576	3,027,456	on-grid	0.04	121
9. Khorma	2013	180	946,080	off-grid	0.3	284
10. Toj	2014	125	657,000	off-grid	0.3	197
11. Tutak	2014	586	3,080,016	on-grid	0.04	123
12. Kuhiston	2013	500	2,628,000	off-grid	0.3	788
<b>sHPPs in pipeline (Financer)</b>						
13. Padrud (GoT)	2016	700	3,679,200	n/a	n/a	n/a
14. Pushti Bog (GoT)	2016	180	946,080	n/a	n/a	n/a
15. Sorvo -1 (n/a)	n/a	375	1,971,000	n/a	n/a	n/a
16. Oksu - 1 (KfW)	2017	800	4,204,800	n/a	n/a	n/a
17. Shirkent – 3 (GoT)	2017	1,200	6,307,200	n/a	n/a	n/a
18. Sebzor (Aga-Khan, GoT)	2019	10,000	52,560,000	n/a	n/a	n/a
19. Husheri (Private Investor)	2016	250	1,314,000	n/a	n/a	n/a
20. Motravn (KOICA)	2016	300	1,576,800	n/a	n/a	n/a
21. Buston Kal'a (Private Investor)	2015	75	394,200	n/a	n/a	n/a
22. Andigon (Private Investor)	2016	200	1,051,200	n/a	n/a	n/a
<b>Totals:</b>		<b>16,777</b>	<b>87,049,872</b>			

<sup>29</sup> Energy emission factors determined by Mr. Dzmitry Halubouski TT Project GHG Consultant Report, "GHG Emission Reductions for the TT Project", September 2014

<sup>30</sup> This sHPP was already operational at the commencement of the TT Project but credited with GHG reductions from the sale of electricity to BT as a result of TT Project technical assistance to formulate the RES Law.

<sup>31</sup> All sHPPs listed here are credited with GHG reductions to the Project

### 3.2.2 Remaining Barriers to Achieving the Project Objective

- Lack of consistency in implementing the RES Law, notably in the applying appropriate tariff calculations, preparation of power purchase agreements by BT to purchase excess electricity from sHPP owners, and timely reimbursement to sHPP proponents;
- Difficulties in the procurement of technical services to ensure pilot sHPPs are constructed according to the intended designs, and to ensure the sHPPs are fully functional and operational according to best practices;
- Lack of community-based knowledge to properly operate and maintain sHPP facilities and ensuring reliable supplies of electricity to end-users;
- Lack of reliable sources of financing for future sHPPs.

#### **Box 1: Uniqueness of Technology Transfer Approach of this Project**

Under Output 2.2, the Project hired Komperg (out of Croatia) to transfer technology of their turbine designs for the purposes of manufacture and supply of their turbines to the Tajikistan SHP market. To the knowledge of this Evaluator, this is a unique arrangement amongst GEF projects in developing small hydropower projects in developing countries. This is unique in that most technology owners would prefer to sell their technologies and protect their intellectual property. This activity has been effective consisting of training and technology transfer to workshop welders and superintendents on sHPP design, assembly of related equipment and operations. There is evidence from study tours that senior personnel in the EN and KM workshops have “latent” extensive workshop experience in metal fabrication, welding and equipment manufacture from the 1980s when these personnel provided full-time services to government utilities under the former USSR. Since the breakup of the USSR in 1991, it is likely that personnel from these workshops have not used their skills extensively due to the economic hardships in Tajikistan since that time. If the operations of these workshops can be sustained after the EOP, these personnel could play a key role in improving productivity and the quality of equipment from these workshops.

## 3.3 Project Implementation and Adaptive Management

### 3.3.1 Management Arrangements

The management arrangements for this Project are being implemented under a DEX modality, based on the integration of the Project and the project “Scaling up of Area Based Integrated Rural Development” that is funded with UNDP TRAC funds. A National Project Coordinator (NPC) from MoEWR was assigned to the Project to serve as the main Government contact point. However, due to a high turnover rate amongst government officials, most of the NPCs go to PSC meetings to be briefed and updated by Project counterparts on the Project goals, objectives, and progress. A Project Manager was assigned to the Project from UNDP to undertake day-to-day operations. The decision for the DEX modality appears logical considering the lack of available personnel and capacity within the MoEWR. In addition, this management arrangement appears to be functional given the outcomes of the Project to date and the frequent dialogue between MoEWR and UNDP at informal meetings and their attendance at Project Steering Committee meetings. Management personnel of this Project have been stable since its operational commencement in April 2012.

UNDP also has a staff civil engineer who has been providing technical oversight to the UNDP-TRAC funded “Scaling up of Area Based Integrated Rural Development”; her involvement with the Project since early 2012 has been beneficial in the provision of required technical oversight on engineering (civil, mechanical and electrical), contracting, construction and commissioning plans with Komperg SHP plans. The Evaluation team believes, however, that the intensity of Project

activities will increase with the implementation of the pilot sHPPs in 2015, and require additional personnel to assist UNDP's staff engineer.

The Project also employed two Chief Technical Advisors (CTA), the first during the September 2012 Inception Phase who did not extend after late 2013 due to other commitments. In early 2014, the Project recruited a new CTA who has been instrumental in assisting the Project in making adaptive management decisions. Using his experience from other similar projects in SHP development, his inputs have been valuable in assisting the Project team to adaptively manage its activities including:

- analysis of the rationale for assisting the Government to establish the Trust Fund of which the primary objective of any assistance should now be to attract its capitalization;
- selection criteria for pilot SHP sites which included availability of water, jamoat readiness for the distribution of the electricity and a jamoat development plan for expanded economic activities;
- the quality of the Technology Transfer program (Output 2.2) with local workshops ER and TTM, and issues related to the quality of electro-mechanical equipment that is locally manufactured, and the solvency issues of each workshop to be able to improve their performance on timely delivery of the equipment;
- scoping a consultancy to provide GHG reduction estimates of the Project; and
- a Project exit strategy.

In summary, the roles of the Project management team are consistent with UNDP and GEF programming guidelines.

Adaptive management of the Project has been required to ensure quality of Project outputs as well as meeting certain timelines. Some notable examples of UNDP adaptive management includes:

- Revision to approaches in the simplification of procedures for licensing and construction of SHPs as early as mid-2012. This included the use of existing working groups as opposed to the establishment of a special working group (as mentioned in the ProDoc) under the Ministry to review and facilitate the process of simplifying these procedures. The working group was to include MoEWR (as the head of the committee), various departments of Barki Tojik and selected academic and NGO personnel from the Association of Energy Professionals in Tajikistan who were best qualified to prepare documentation for streamlined procedures for the licensing and construction of sHPPs;
- In early 2014, further upgrading of the SHP education modules was requested from SHP specialists at the Tajik Technical University to ensure information on energy management, cost-benefit analysis of sHPPs, monitoring and evaluation, and methods to determine GHG emission reductions, requiring further work;
- Delaying submission of technical designs and drawings for the new sHPPs prepared by Komperg to mid-2014 to ensure that tender documents were technically sound and would lead to a well-constructed sHPP. These improvements were necessitated by the need to ensure that contracting entities bidding on these contract documents can provide a reasonable price for construction, and deliver the services required to construct and commission a completed sHPP in remote areas and under challenging conditions related to access;
- Ensuring SHP development activities are synchronized between April and October when civil works could be implemented at a time when water flows are minimal and temperatures

are sufficiently warm for field work (such as excavations and concrete pouring). This has led to intense activities during the 2014-15 winter season to select general civil contractors for the Pinyon and Hijborak sHPPs (each 100 kW in installed capacity). For these sHPPs, a pre-qualification process was initiated in mid-2014 resulting in the selection of competent local companies to participate in the Invitation to Bid for the construction of these SHPs;

- The Project leveraging additional funds for construction of 2 sHPPs from the JICA-funded LITACA project that was signed in March 2014. This has necessitated the disbursement of Project resources for preliminary assessments of the sHPPs sites and target districts and coordinating activities with local authorities to implement these sHPPs projects under an IRD model approach. This has also required time-consuming coordinating efforts to ensure timely implementation of IRD activities with all key stakeholders while ensuring key sHPPs construction activities are implemented during the 2015 or 2016 construction window; timely implementation will result in meeting suppressed electricity demand in schools, health clinics and local businesses.

In general, the overall effectiveness of the current Project management arrangements has been generally satisfactory given the outcomes to date. However, there are a few Project implementation issues including:

- Approaches to establish the NTF for MoEWR have not resulted in any traction to capitalize the fund. The issue clearly has been a lack of a sound strategic business plan which would contain elements to interest potential financiers of the NTF. This strategic business plan should identify the purpose of the NTF, the strategic vision of the government in developing energy efficiency and renewable energy as a means of achieving the country's energy security, targets and milestones for achieving energy security, and funds required to achieve targets and milestones;
- The aforementioned pre-qualification process of mid-2014 for general civil contractors was a response to a lesson learned from the difficulties and delays in the selection process for qualified companies to deliver SHP technology transfer services to local workshops in Tajikistan (Output 2.2) and the preparation of SHP engineering designs for construction (Output 3.1). Due to Project Management's lack of preparedness and familiarity with regional and international companies who offer these types of services, the actual procurement and selection of Komperg took almost one year, from late 2012 to late 2013. The impact of this delay was the loss of 2013 to substantially complete engineering designs for 2 of the 5 pilot sHPPs under Output 3.1, and the likely cause of the Project not being able to commence or even complete construction on 2 sHPPs during 2014;
- The need for submission of construction documents to the National State Expertise at the Agency for Architecture and State Construction. The reason for the need for this submission is that national legislation does not allow a foreign design company to develop designs for Tajikistan without a local license. This applied to the documentation prepared for Hijborak and Pinyon sHPPs that was prepared by Komperg a foreign design company, necessitating a review by the Agency. The process added 40 days for a local design company to adapt the design documentation prepared by Komperg and another 40 days to the approval process which needs to be included as a part of the permitting process for sHPP construction plans;

### 3.3.2 Work Planning

Work planning is conducted on the basis of annual work plans (AWPs) that are prepared under a special working group with MoEWR in the 4<sup>th</sup> quarter of each year. Quarterly project monitoring

matrix reports (QPMMs) and Project Implementation Reports (PIRs) provide the information on results of the Project that are used as result-based rationale for proposed activities in the AWP. For example, the QPMM has an implementation/quality log that provides details of the actual progress made, and comments on delays and shortcomings and measures to address them. The QPMM also provides a discussion on Project issues, risks and financial management. PIRs provide feedback from several levels of UNDP management (from Regional to the Country Office and Project Manager) as well as Implementation Partners. The primary means of communication on implementation and monitoring issues is through e-mail, meetings and cell phone calls..

### 3.3.3 Finance and Co-Finance

Project progress is reflected in the rate of expenditure during its initial 24 months during where only USD 0.458 million or close to 23% of the total Project budget was expended up to March 31, 2014. The expenditure rate is expected to increase considerably during 2015 with the Project supporting the capital cost of approximately USD 0.95 million for two pilot sHPPs under Component 3. The remaining amounts of approximately USD 0.54 million are currently allocated for technical assistance, mainly Component 2: Enhanced technical know-how and developed market chain for sHPPs.

For activities that have been funded by the Project to date, the financial management of Project funds has been satisfactory considering the actual achievements that would include as the tariff calculation methodology and adoption and operationalization of the RES Law (Output 1.1), training of central and local government personnel on the application of RES Law to SHP development (Output 1.2), development and distribution of SHP development guidebook (Output 2.1), current activities into building local capacity for manufacture of SHP equipment and O&M of SHPs (Outputs 2.2 and 2.3), and the ongoing activities in preparing feasibility studies and integrated development plans for SHP projects (Output 3.1), ongoing activities to complete operational sHPP demos including the SHP in Buronov jamoat (Output 3.2), and ongoing efforts to sustain sHPP operations including mechanisms for PPAs and supporting local businesses to sustain electricity demand from sHPPs (Output 3.3). These achievements are detailed in Table 1. Moreover, the Project has appropriate financial controls which include:

- the entry and updating of financial information into the ATLAS system that divides the Project expenditures into the various components as shown on Table 3. Through these means, the expenditures of each component can be tracked and monitored for any irregularities;
- QPMM reporting which supports results-based management decisions of Project Management at UNDP and the PSC for informed budgetary decisions.

The Project has been able to leverage co-financing from a number of sources including:

- UNDP for capacity building activities for Government personnel, and for equipment purchased for the ER and KM workshops;
- MoEWR for in-kind assistance related to the construction of 5 sHPPs with installed capacity of 1.967 MW; and
- ER and KM workshops for in-kind assistance towards installation of equipment, and use of their workshops for technology transfer sessions.

**Table 3: Project Budget and Expenditures (in USD)<sup>32</sup>**

Outcome	2011-2012	2013	2014	2015	Total Disbursed	Total Planned for Project	Total Remaining
Outcome 1: Adapted and enhanced legislative and regulatory framework for SHP development		\$1,049.50	\$2,306.91		3,356	50,000	46,644
Outcome 2: Enhanced technical know-how and developed market chain for SHP		\$1,763.61	\$344,266.04		346,030	750,000	403,970
Outcome 3: Improved confidence on viability of integrated SHP-based rural development model		\$6,330.71	\$62,063.81		68,395	1,015,000	946,605
Outcome 4: National Scaling-up Programme of Renewable Energy-based Integrated Rural Development					-	35,000	35,000
Project Management Unit	4,749	\$6,979.67	\$28,144.22		39,873	150,000	110,127
Total (Actual)	4,749	16,123	436,781	-	457,654	2,000,000	1,432,219
Total (Cumulative Actual)	4,749	20,873	457,654	457,654			
Annual Planned Disbursement (from AWP)	14,007	372,624	1,103,926	518,700			
% Expended of Planned Disbursement	34%	4%	40%	0%	Total expenditure till date - - >		23%

Additional co-financing in the order of USD 1.0 million is expected from the JICA-funded LITACA Project for the capital cost of the Jilikul and Shurobod sHPP projects. Construction of these sHPPs is scheduled for late 2015 or early 2016, and would likely not be completed prior to the current EOP of the Project. Other proposed co-financing for 2015 and 2016 will come from further disbursements from UNDP (USD 327,000), MoEWR (USD 3.5 million) and the ER and KM workshops (USD 94,000). Total financing by the EOP will likely be in the order of USD 9.68 million. An updated project co-financing table is presented under Table 4.

### 3.3.4 Project-Level Monitoring and Evaluation Systems

The Project's M&E system consists of the Project Inception Report, Quarterly Project Monitoring Matrix (QPMMs), annual Project Implementation Reports (PIRs), and periodic site visits through Project staff and the Chief Technical Advisor.

The Project Inception Workshop was held on 26 September 2012, nearly 5 months after the signing of the ProDoc on the 1 April 2012. The Project Inception phase resulted in few significant changes to the Project design, notably the dropping of activities related support the generation of credits from CDM.

As detailed in Section 3.3.2, QPMM served as the main M&E report for the Project. The QPMM reports contained an implementation/quality log that provides details of the actual progress made, and comments on delays and shortcomings and measures to address them. Information from these reports is used to provide information on Project results that are used for result-based

<sup>32</sup> Project expenditures in 2014 are only up to March 31, 2014

management and rationale for proposed activities in the AWP. The QPMM also raises Project issues on actual or potential delays during implementation and the means of overcoming these issues. Risks are identified and financial performance from ATLAS outputs is reported. These reports provide adequate information on progress along with comments on shortcomings and possible adaptive management actions to be undertaken during subsequent reporting periods. All QPMMs were available to the Evaluator for this MTE.

**Table 4: Details of Project Co-Financing<sup>33</sup>**

Partner Agency	Co-Financing Amount		Activities to date
	EOP Target (USD)	to November 2014 (USD)	
UNDP	1,330,000	1,209,982	<ul style="list-style-type: none"> <li>Project operation expenses</li> <li>Capacity building of the government officials;</li> <li>Procurement of equipment for ER and KM<sup>34</sup>;</li> <li>Development of education and promotional materials (SHP construction guidebook, RE and EE booklets, etc.)</li> </ul>
JICA Funded LITACA project	1,000,000	0	<ul style="list-style-type: none"> <li>For the construction of 2 sHPPs</li> <li>Promotion of IRD in the Tajik Afghan Cross-border areas</li> <li>To be disbursed in late 2015 and 2016</li> </ul>
Ministry of Energy and Water Resources	1,500,000	4,400,000	<ul style="list-style-type: none"> <li>5 sHPPs with a total capacity of 1,967 kW</li> </ul>
CJSC “Energoremont” (ER)	100,000	78,400	<ul style="list-style-type: none"> <li>Installation and use of equipment and machinery for the production of the turbines;</li> <li>Using the factory space and resources for the Technology transfer processes</li> <li>Creating space for the machinery through repairing a workshop on the factory floor</li> <li>Training and retraining the company staff</li> <li>Human resources</li> </ul>
State unitary Enterprise “Tajiktekstilmash” (KM)	100,000	63,412	<ul style="list-style-type: none"> <li>Installation and use of equipment and machinery for the production of the turbines;</li> <li>Using the factory space and resources for the Technology transfer processes</li> <li>Creating space for the machinery through repairing a workshop on the factory ground</li> <li>Training and retraining the company staff</li> <li>Human resources</li> </ul>
Eurasian Development Bank	0	180,000	<ul style="list-style-type: none"> <li>Feasibility studies of SHPs on the irrigation channels in 2013 out of which 20 SHP sites were assessed for feasibility.</li> </ul>
<b>Total:</b>	<b>4,030,000</b>	<b>5,931,794</b>	

<sup>33</sup> See Appendix D for actual co-financing to planned co-financing commitments made in the ProDoc

<sup>34</sup> Equipment procured was valued at USD 320,000 and included computers, plasma welding apparatus, rotary hammer, percussion drill, drilling and milling machine, grinding machine, and a comprehensive tool set.

Annual PIRs were also provided to the Evaluators that served as a summary of progress towards development objectives or intended outcomes of the Project. These reports also contained general ratings and comments on Project progress from the Project Manager to the Country Office to the Regional Technical Advisor.

Periodic site visits to Burunov jamoat for the Nurofar sHPP have also been made by UNDP staff generally on a monthly basis or more frequently as required. Nurofar is conveniently located west of Dushanbe as a day trip. However, other sHPP locations such as the Sorvo sHPP in Romit are more difficult to poor access roads to these sites. As such, they have been visited at least once per month (weather permitting in the winter time) with more frequent visits planned as construction activities become more intense.

The new CTA has also made 3 visits to Tajikistan in 2014 to assist in the monitoring of capacity building of the EN and KM workshops, progress on the preparations for engineering designs from Komperg, monitoring of sHPP construction progress, issues related to the setup of the National Trust Fund and the Project exit strategy. His reports have provided valuable monitoring information from the perspective of an outsider to Tajikistan that contributes to the quality of adaptive management required for this Project.

In general, the Project's M&E systems are satisfactory.

### **3.3.5 Stakeholder Engagement**

This Project has engaged a wide range of stakeholders. The stakeholders can be categorized into three categories of partnerships.

The primary partnerships formed on this Project are with national and local government stakeholders involved with the power sector, namely MoEWR and Barki Tojik as well as the Ministry of Economic Development and Trade, Ministry of Finance, Agency for the Antimonopoly control, the Ministry of Justice, and the local jamoats. In addition to informal meetings, partnerships with these agencies have been strengthened through capacity building workshops for SHP development (under Output 1.2). The Evaluation team has observed the effectiveness of UNDP in its engagement of government stakeholders in comparison with other donors. This includes the ability of UNDP to have frequent meetings with Government personnel at all levels. Most Government personnel interviewed also said that UNDP was one of only a few donors in Tajikistan to provide effective technical assistance to the Government on topics that were relevant to building their knowledge and capacity for managing the growth of the energy sector through the development of SHPs. In particular, they were satisfied with the technical assistance on legal issues to support sHPP, the SHP guidebook, and pre-feasibility studies for 27 sHPP projects.

A second stream of stakeholder engagement has been through the Project beneficiaries that include local manufacturers and workshops to install, construct and manufacture SHP equipment and components as well as local community-based entities that operate sHPPs and benefit from electricity generation from SHPs:

- Under Output 2.2, capacities of the EN and KM workshops are being built to supply the market with electro-mechanical equipment for sHPPs with international TA inputs from Komperg and the Project's International Electro-Mechanical Engineering Consultant. The Project is providing assistance to improve the quality of their products and to improve the delivery efficiency. Both workshops are keen to improve their capacity as evidenced by



their co-financing pledges of USD 100,000, and their proceeding with manufacturing of turbines (during late 2014) despite the lack of a signed contract with the Project to supply electro-mechanical equipment. This is currently being rectified by the Project since the lack of the contract will affect the delivery of generator equipment and delay commissioning of the sHPP. The partnerships will be challenged, however, in future due to the issues related to working capital shortages that likely will persist as a problem in the operations of these entities<sup>35</sup>;

- Under Output 3.2, the Project has engaged the local jamoat at Burunov through the entity “LLC Dehoti Obod” to sustainably operate and maintain the SHP at Nurofar. This includes collection of fees for electricity sales in the community. The Project through the jamoat has supported the training of personnel in Dehoti Obod in the O&M of the SHP as well as providing technical assistance on computer software for electricity billing, and licensing and registration procedures for SHPs.

A third stream of stakeholder engagement has been with the donor community in an effort to secure more fiscal or technical resources to advance SHP development in Tajikistan. Engagement has mainly been through the donor coordination committee (DCC) meetings as well as bilateral meetings that involve the World Bank, ADB, EBRD, EU, KfW, GIZ, and USAID amongst other donors. Most of these donors are focused on structural reforms in the energy sector, and support for large power projects such as the 3,600 MW Rogun hydropower project and the CASA 1000 Transmission Project. The Project under UNDP, however, is leading the important development of small hydropower projects that is viewed by all and supported by the GoT as an interim measure to meet the energy demands for rural households of Tajikistan prior to the development of the large hydropower projects and the CASA 1000 Transmission Project. As such, the engagement of other donors to the Project has only been successful in so far as the involvement of the Japanese Government on supply of capital funds under the LITACA-funded project for the Jilikul and Shurobod pilot sHPP projects. The further involvement of donors in capitalizing the NTF for RES and EE has not been successful due to the lack of clear vision on the use of the fund, and preliminary statements from the GoT of the use of the NTF for subsidizing electricity sales to rural households.

Opportunities for stronger partnerships are two-fold:

- with the local communities or the Jamoat level. While there have been partnerships already formed at this level for local approval of the proposed sHPP projects, the strengthening of these partnerships will benefit sHPP development in future as it pertains to operation and maintenance. Through these strengthened partnerships, a stronger operation and maintenance culture of the sHPPs can be built that will benefit rural households in Tajikistan and provide greater assurances of the delivery of reliable electricity supplies; and
- with senior personnel at the KM and EN workshops with “latent” experience in the manufacturing and assembly of SHP-related equipment. An assessment of these personnel should be conducted as to what incentives they would need to become more involved with ongoing workshop operations. If feasible, these personnel could become mentors for quality control and timely delivery of products coming from these workshops.

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<sup>35</sup> The KM and EN workshops are caught in a cycle of working capital shortages caused by delayed and late payments for past service contracts (mainly with Government) and a limited credit line with insufficient resources for operational costs of subsequent contracts. As a result, timely delivery of products from these workshops is a significant challenge.

### 3.3.6 Reporting

Project progress reporting has been through “Quarterly Progress Monitoring Matrix” (QPMM). These are broken down into Project performance, an implementation quality log, project issues, risk, financial management and required next steps. The QPMMs serve as the main format on which adaptive management changes to the Project are reported. The Evaluation team had access to all QPMMs since the start of the Project in 2012.

The Project also prepares PIRs that are issued annually to summarize progress towards development objectives or intended outcomes of the Project. These PIRs follow the standard UNDP PIR format and provides general ratings and comments on Project progress from the Implementing Partner, the Project Manager and Programme Manager of the Country Office as well as the Regional Technical Advisor.

The Evaluation Team also had access to mission reports by the Komperg and the CTA. Both sets of reports provide good details of all Project issues and recommendations. Continued submission of this quality of reporting bodes well for the future management of this Project.

### 3.3.7 Communications

The internal communications between the Project and its stakeholders is through e-mail, phone, informal meetings and at a higher level, the PSC meetings which are held every 6 months. With community-based stakeholders, the Project is using UNDP’s resident engineer and other project personnel for communication with remote communities.

There is a need for strong coordination between the civil and electro-mechanical contractors and the jamoats communities for the Sorvo sHPP (currently being constructed) and the Pinyon and Hijborak sHPPs (slated for construction during 2015). Additional coordination personnel are required by UNDP Project Management to strengthen and provide more frequent communications with jamoat personnel to ensure all community concerns are addressed with SHP and IRD activities, and to coordinate delivery of electro-mechanical equipment with the completion of civil works at these sHPP sites. Delays from the lack of coordination between all the construction activities will be very costly; hence, the shortage of coordination personnel is recognized by UNDP Project Management as being crucial to meeting the operational SHP targets of the Project.

There are also DCC meetings that are convened once a month with the donors to coordinate activities to minimize overlaps. UNDP attend these meetings on a regular basis in an attempt to minimize overlaps between donor projects.

No other relevant stakeholders can be identified at this time that have been left out of Project communications. The Project staff has in general managed to maintain good communications with all stakeholders notwithstanding the difficulties related to the remoteness of many of the target communities, their lack of reliable electricity supplies, and the distances to reach these communities.

The overall rating for the Project implementation and adaptive management is *satisfactory*.

### 3.4 Sustainability

In assessing Project sustainability, we asked “how likely will the Project outcomes be sustained beyond Project termination?” Sustainability of these objectives was evaluated in the dimensions of financial resources, socio-political risks, institutional framework and governance, and environmental factors, using a simple ranking scheme:

- 4 = *Likely (L)*: negligible risks to sustainability;
- 3 = *Moderately Likely (ML)*: moderate risks to sustainability;
- 2 = *Moderately Unlikely (MU)*: significant risks to sustainability; and
- 1 = *Unlikely (U)*: severe risks to sustainability.
- *Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.*

The overall Project sustainability rating is moderately unlikely (MU). This is primarily due to:

- The uncertainty of financing of all components of the Project including:
  - institutional strengthening programmes after the EOP;
  - ensuring adequate working capital is available for the local workshops for the continual supply of locally manufactured sHPP-related equipment;
  - the need for more sHPP pilot projects with IRD activities to demonstrate the economic viability of sHPP investments; and
  - the need for secure streams of revenue for electricity subsidies for households in remote communities;
- The continual need to strengthen national institutions that regulate sHPP development and local government jamoats to:
  - consistently apply the RES Law to sHPP projects that are being developed, ensure sHPP approvals are streamlined, and to review the regulatory framework periodically;
  - ensure rural communities can receive subsidies for reliable local supplies of electricity; and
  - enable local jamoats to sustainably operate and maintain sHPP facilities and provide reliable supplies of electricity to their communities.

Details of sustainability ratings for the Project are provided on Table 5.

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**Table 5: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2014)	Assessment of Sustainability	Dimensions of Sustainability
<p><b>Actual Outcome 1:</b> Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country</p>	<ul style="list-style-type: none"> <li>• <u>Financial Resources:</u> There are some financial risks due to the shortage of fiscal resources to continue training of government personnel to apply the new RES Law consistently after the EOP;</li> <li>• <u>Socio-Political Risks:</u> No risks as there is strong GoT support for this Project and its benefits in energy security for Tajikistan;</li> <li>• <u>Institutional Framework and Governance:</u> Despite ongoing and effective capacity building efforts of the Project, there remains a substantial risk that these efforts to build capacity amongst personnel of MoEWR, MoEDT, Ministry of Finance, Agency for the Antimonopoly control, Barki Tojik, and Ministry of Justice will not lead to consistent application of all laws (particularly the new EE and energy savings law adopted in 2013), policies and regulations to promote RE sources (in particular small hydropower), and streamlining of sHPP approvals. There is clearly a need for continued capacity building to reduce governance risks in the design, construction, operation and maintenance of SHP projects after the completion of the Project;</li> <li>• <u>Environmental Factors:</u> There are no environmental risks.</li> </ul> <p style="text-align: right;"><b>Overall Rating</b></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">4</p> <p style="text-align: center;">2</p> <p style="text-align: center;">4</p> <p style="text-align: center;"><b>2</b></p>
<p><b>Actual Outcome 2:</b> Enhanced technical and planning know-how and developed market chain for SHP in Tajikistan</p>	<ul style="list-style-type: none"> <li>• <u>Financial Resources:</u> Shortage of working capital in the workshops will disrupt operations and threaten continuous supply of sHPP-related equipment to the programme;</li> <li>• <u>Socio-Political Risks:</u> Moderate risks since there are senior personnel who are familiar with assembly of SHP-related equipment who are working with less senior personnel who have little or no experience with the assembly of such equipment. Absorptive capacity of junior personnel poses a moderate risk to building capacity of the local supply chain for SHP-related equipment. Despite ongoing and effective capacity building activities that serve as a valuable “developmental” building block, a continuation of capacity building of these workshops after the EOP may be required. This can be assessed at the EOP;</li> <li>• <u>Institutional Framework and Governance:</u> There are no institutional and governance risks to capacity building of local workshops;</li> <li>• <u>Environmental Factors:</u> There are no environmental risks to capacity building of the EN and KM workshops.</li> </ul> <p style="text-align: right;"><b>Overall Rating</b></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">3</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;"><b>2</b></p>

**Table 5: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2014)	Assessment of Sustainability	Dimensions of Sustainability
<p><b>Actual Outcome 3:</b> Improved confidence on the technical and economic viability of integrated SHP-based rural development model</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> More pilot sHPPs coupled with IRD are needed to demonstrate that there are sufficient finances available for economic viability of sHPPs;</li> <li>• <i>Socio-Political Risks:</i> No community opposition expected in demonstrating technical and economic viability of integrated SHP-based rural development model;</li> <li>• <i>Institutional Framework and Governance:</i> No risks as local and national government are strongly supportive of the pilot sHPP approach;</li> <li>• <i>Environmental Factors:</i> There are no environmental risks to the demonstration of pilot sHPPs to increase confidence of a sHPP development coupled with IRD.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p style="text-align: center;">3</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;"><b>3</b></p>
<p><b>Actual Outcome 4:</b> National Scaling-up Programme of Renewable Energy-based Integrated Rural Development</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> With a lack of commitments for sourcing capital for the National Trust Fund and wide acknowledgement in the energy sector that electricity tariffs for SHPs are not sufficient to induce private investment, other sources of revenue are required to sustain SHP development in Tajikistan including bilateral contracts with businesses within the communities that the sHPP serves<sup>36</sup>, and revenue from the CASA 1000 project<sup>37</sup>. With sustained revenue from these sources successfully applied to the operational costs of sHPP projects, sHPP development can be financially sustained. However, until the Project can successfully demonstrate revenue generation from bilateral contracts with local businesses, the Project will be continue to be moderately unsustainable from a financial perspective;</li> <li>• <i>Socio-Political Risks:</i> No socio-political risks as there is high demand amongst rural households for reliable supplies of electricity;</li> <li>• <i>Institutional Framework and Governance:</i> Barki Tojik and MoEWR will need capacity building if they are to sustain a programme for scaling-</li> </ul>	<p style="text-align: center;">2</p> <p style="text-align: center;">4</p> <p style="text-align: center;">2</p>

<sup>36</sup> This is being demonstrated by the Project with the sale of electricity from a Burunov-based jamoat entity to a local business at a rate less than electricity bought from Barki Tojik. Thus far, revenue generation from this model is demonstrating that sHPPs can be viable investments. The issue, however, is the reliability of water supply for sHPP projects that in some instances are reliant on small catchments that lead to moderate risks of water shortages during certain months, and higher exposure to climate change-related water shortage

<sup>37</sup> While the construction of the transmission line appears to be imminent with a completion date of 2018, the revenues from electricity sales from CASA still need to be properly allocated towards sustaining subsidized SHP operations in rural areas. There are efforts financed by the ADB to re-structure Barki Tojik to be able to effectively manage incoming revenue streams from electricity sales to South Asia. There is still a high risk, however, that there may not be sustained revenues for several years from a re-structured Barki Tojik that can subsidize rural electricity supplies from sHPPs.

**Table 5: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2014)	Assessment of Sustainability	Dimensions of Sustainability
	<p>up the development of sHPPs. There are also risks that current capacity building activities of the Project for proper operation and maintenance of sHPPs will not be sufficient. The issue is outreach to these communities (due to their remote locations) and insufficient absorptive capacity of some jamoats. While the Project serves as a start towards sustaining SHP operations in Tajikistan, there is clearly a need for continued capacity building in local jamoats after EOP to ensure best practices for operation and maintenance of SHP projects are implemented;</p> <ul style="list-style-type: none"> <li>• <u>Environmental Factors:</u> There are no environmental risks to a scaled-up programme for sHPPs.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p style="text-align: center;">4</p> <p style="text-align: center;"><b>2</b></p>
	<b><u>Overall Rating of Project Sustainability:</u></b>	<b>2</b>

## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

- The primary cause of slow development of sHPPs in Tajikistan is related to low electricity tariffs and a resulting poor investment environment. As such, the continuation of the development and sustained operation of sHPPs will depend to a large extent on the ability of the Project and the Government to demonstrate that revenue can be generated from within the jamoats where IRD activities along with SHP developments are located. The challenge is for the proper maintenance and operation of these sHPP investments over the next 5 years or whenever new revenue sources (such as revenues from local economic activities or the CASA 1000 Transmission Project) can be realized;
- According to the latest information, the CASA 1000 Project is a possible source of sustained subsidy funding for sHPP operations by 2018<sup>38</sup>. If so, this Project has more strategic importance in building the capacity of Tajikistan's supply chains and institutions to position the country to develop sustained SHP power generation for rural communities over the next 4 to 5 years, and to maximize its economic benefits using the IRD approach for community development. This can be augmented through demonstration of the IRD approach with the sHPPs being planned for construction during 2015 (for the 100 kW Pinyon SHP and the 100 kW Hijborak SHP as well as the 30 kW Sorvo SHP currently being constructed); these SHPs will provide a reliable supply of electricity and generate community-based sources of revenue to sustain purchases of electricity generated from these SHP investments;
- In consideration of the challenges encountered, the Project is being implemented in a satisfactory manner on most activities related to building capacity for SHP development, institutionally and at the beneficiary level. There are areas, however, that will need more focused assistance towards the meeting Project targets including:
  - ⇒ Improving capacity of the workshops towards timely delivery of quality turbine products. Welding quality and working capital of the supply workshops are issues. Komperg, the TT consultant for the Project, is in the process of organizing workshops to improve the quality of welding on the electro-mechanical equipment;
  - ⇒ There are efforts underway as of January 2015 to hire general contractors for the civil works and construction of the sHPPs at Pinyon and Hijborak. Given the uncertainty of the capacity of local contractors to complete these sHPP works in remote areas, the tendering of these works will require careful preparation and strategic inputs from the Project's construction engineers. The reasons for these inputs is to undertake a critical review of construction plans to reduce the uncertainty of tendered construction costs, to conduct an in-depth review of the abilities of civil contractors to implement sHPP construction in remote areas<sup>39</sup>, and to formulate unique contracting arrangements that will reduce cost uncertainties and increase probabilities of timely delivery of completed sHPPs<sup>40</sup>;

<sup>38</sup> The CASA 1000 Project is designed to deliver hydropower from Tajikistan and Kyrgyzstan through newly constructed transmission lines (financed through World Bank financing) to Pakistan and Afghanistan electricity markets in return for an estimated USD 200 million annually into the Tajikistan market. A re-structured Barki Tojik can possibly allocate this revenue into subsidies for electricity to rural marginal income households that will benefit from electricity from sHPPs developed by this Project as well as the Government.

<sup>39</sup> This would include an estimate of the company's working capital, estimated costs to mobilize and operate in a remote sHPP location, and risks to the construction schedule based on weather and other logistical risks.

<sup>40</sup> This may include an option to allow a contractor to bid on two sHPP sites.

- ⇒ Provision of sufficient engineering inspection and oversight of all activities from the quality of workshop products to the quality of civil works being constructed as designed, and adhering to schedules provided under the contract. If necessary, there should be mechanisms to change the designs as deemed necessary from new site condition information;
  - ⇒ Operation and maintenance of sHPPs. It is understandable that not much attention has been paid to this issue given the primary focus is currently on demonstrating successful construction of sHPPs. However, once two sHPPs are completed in 2015, there will be a focus on O&M of newly commissioned sHPPs;
  - ⇒ Further to O&M of sHPPs, there is no attention is being paid to more than 150 dysfunctional sHPPs which have been constructed over the past 20 years from the state budgets (as reported in the Parliamentary hearings of December 2012). Based on the visits of the Head of the Electrical Engineering Department of TTU to a few of these sHPPs, he recommends that an expert assessment be conducted for each of these sHPP facilities including details of the repairs or design adjustments and routine maintenance required. The Project needs to position itself to provide assistance to O&M issues at the jamoat level for these sHPPs;
- With the current Project EOP date of April 1, 2016, there is only one season remaining to construct pilot sHPPs. Recent progress reports indicate only 2 sHPP pilot projects will be ready for construction in 2015 (Pinyon and Hijborak), with the Project only being able to achieve the completion of 4 sHPPs by the EOP date (this includes Dashti Yazgulom and the Sorvo SHPs), 1 short of the target of 5 sHPPs;
  - Despite the commitment of the LITACA Project to provide capital funding for Jilikul and Shurobod sHPPs, these will not be completed by the current EOP date of April 1, 2016 since the designs will be prepared through Komperg in 2015 with actual construction and commissioning of these sHPPs by late 2016, after the EOP date;
  - With the remaining resources on the Project budget, the top Project priority should be ensuring the successful completion of pilot sHPPs. Despite the high priority placed by the GoT on the establishment of the National Trust Fund (NTF) for RES and EE at this time, the lack of interest from the donors to capitalize the NTF substantially increases the likelihood that the Project target to establish an RE Trust Fund by the EOP can no longer be achieved;
  - The work being done by the Project fills a large void in the arena of donor assistance to the energy sector of Tajikistan.

## 4.2 Recommendations

**Recommendation 1: The Project should have as a top priority the successful completion and operation of the 4 sHPP projects currently under implementation**<sup>41</sup>. To do so, this Evaluation supports the Project's decisions to recruit competent individuals for coordination and management of the construction contracts. In addition to the UNDP Resident Engineer already on staff, two additional project engineers and a part-time CTA are required to:

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<sup>41</sup> This includes Hijborak, Pinyon, Sorvo and Dashti-Yazgulom sHPPs, all of which are assumed to be completed by EOP. See Table 2.



- provide additional inputs into tendering cost estimates in an effort to reduce its uncertainty and provide more certainty to the UNDP-GEF budget<sup>42</sup>. The objective of these additional efforts and inputs is to obtain a good price and confidence that the bidder can perform the works as proposed and on schedule. If the tender opening for the Invitation to Bid for the Pinyon and Hijborak sHPPs results in cost estimates that are too high for the Project budget or the capacity of the bidders is assessed to be insufficient to do the work proposed on the actual bid, completion of these sHPPs will be substantially delayed due to the need to re-tender the works after further inputs by the project engineers;
- considering the remote location of all sHPPs, provide additional coordination between the civil and electro-mechanical contractors to ensure the delivery of the equipment coincides with completion of civil works such as the powerhouse floor and draft tube;
- provide good communications with the heads of the jamoats of all communities where sHPPs are being constructed. This includes the Sorvo sHPP (currently being constructed) and the Pinyon and Hijborak sHPPs (slated for construction during 2015). It is envisioned that the jamoats will own and operate the new sHPPs, have personnel involved with its implementation as well as rural development activities that are integrated with the electricity delivered by the new sHPP;
- monitor quality of construction and equipment installation, obtain commitments from the contractors to address shortcomings, and provide construction progress reports; and
- ensure adherence to bid schedule or propose alternative scheduling in consultation with the jamoat heads.

**Recommendation 2: Continue capacity building work with ER and KM workshops with a focus on:**

- Operation and maintenance of welding equipment. This is scheduled for February 2015 with possible additional workshop courses to be delivered at a later date. It is expected that welding best practices will be transferred to welders of ER and KM;
- Providing more site experience for these welders with new welding equipment;
- More integration of senior personnel at the workshops with “latent” experience in the manufacturing and assembly of SHP-related equipment. This should involve an assessment of these personnel to identify incentives for them to become more involved with ongoing workshop operations. If feasible, these personnel could serve as mentors for quality control and timely delivery of products coming from these workshops;
- Signing and honoring contracts for works to be provided for equipment supply; and
- Setup of a minimum of 2 remote workshops near other sHPPs for the purposes of supporting O&M of equipment

**Recommendation 3: Project approaches to provide O&M training for sHPP proponents should include existing sHPPs that were constructed over the past 20 years.**

These sHPPs were the subject of the December 2012 Parliamentary Hearings where it was reported that more than 50% of these sHPPs were not operational. If the Project has sufficient human and fiscal resources, the following actions could be taken with Komperg to bolster O&M activities during the remainder of the Project including:

- Have discussions with those who have undertaken the initial reconnaissance of the dysfunctional sHPPs, and prepare a short-list of 50 sHPPs for operational assessment and further action for O&M. The sHPP facilities with the highest benefit/cost (B/C) ratio or potential for electricity generation for the least cost should be prioritized;

<sup>42</sup> These efforts may consist of re-costing of the works by the project engineer, and a re-assessment of building material and fuel costs.

- Undertake visits to approximately 15 sHPPs to generate reports for determining details of operational issues, measures to restore and sustain operations<sup>43</sup>, costs to restore, B/C ratio estimates, community readiness for O&M and action plans for restoration;
- Use these reports to train other sHPP Project proponents and their O&M staff on site as well as in regional technical institutes of the country. This training on best O&M practices at SHP facilities should include personnel from local jamoats, O&M staff, and vocational personnel;

It is important, however, to ensure that there are sufficient finances (either from the Project or from another source) to recruit an engineering team to undertake these assessments and training. If this recommendation is undertaken, it will be done without distraction from the importance of successfully completing the construction and operation of the 4 sHPPs mentioned under Recommendation 1.

**Recommendation 4: With \$1.4 million and 16 months remaining on the Project, a 15-month extension until June 30, 2017 is recommended for the following reasons:**

- With the annual construction window in Tajikistan being April to October, a 9-month extension will provide the Project another construction season in 2016 in addition to the one already scheduled for 2015;
- With an additional construction season and the current progress of preparation of the 4 remaining SHP projects to be developed, two sHPPs will have construction completed in 2015, and another 2 sHPPs under the LITACA Project, Jilikul and Shurobod, will be completed in 2016. This will meet the target of 5 operational sHPPs set by the Project PPM;
- The additional construction year will provide an opportunity for the Project to deliver additional and needed technical assistance to civil contractors, the ER and KM workshops in the delivery of electro-mechanical equipment, and to GoT personnel in the consistency in application of the new RES Law and permitting of new sHPPs; and
- The Project will have sufficient time during 2017 to implement Component 4 and the proposed scale-up of small hydropower development in Tajikistan.

Approval of an extension is subject to two conditions:

- Submission of proof of commitments for capital funding under the LITACA Project (under the Government of Japan); and
- Submission of a work plan for 2015, 2016 and 2017 to demonstrate there are sufficient funds (from the Project and other sources if GEF funds are insufficient) for the completion of designs for the Jilikul and Shurobod sHPPs, the tendering process for civil contractors for these sHPPs, construction supervision and commissioning of the plants and their operation and maintenance.

**Recommendation 5: In consideration of the resources remaining on the Project, provide assistance to the Government (if there are sufficient resources) in the setup of the RE Trust Fund (or NTF). This assist the MoEWR in the strategic business planning of RES development. This will also inform potential financiers and donors to the Fund of the Government's financial requirements for developing SHPs over the next 10 or 20 years, and increase the likelihood of NTF capitalization.** A strategic business plan for developing

<sup>43</sup> This will include details of the design adjustments, repairs and routine maintenance for sustained operation of the sHPP.

renewable energy sources in Tajikistan is required if there is to be any progress on setting up of the NTF. A general outline of the plan needs to cover the following issues:

- Background and forecast of energy demand and supply over the next 10 to 20 years;
- Listing of potential RE sites throughout the country;
- Strategic plan for development of RE projects and costs over the next 10 years to 20 years to minimize suppressed energy demand. This would also a re-structured Barki Tojik and approaches to include the private sector and more IRD-based projects to developing RE power generation projects;
- Capacity and institutional building requirements that would include technical and vocational training and training to government personnel for consistent application of the RES Law;
- Financial requirements based on strategic plan for development of RE projects, and identification of sources of funding for RE development in Tajikistan.

**Recommendation 6: The Project should revise its strategies to work towards its GHG reduction and energy generation targets:**

- The GHG target of “avoided GHG emissions from rural communities” energy use by EOP is 45 ktonnes CO<sub>2</sub>. The Project should count towards this target:
  - the GHGs from the 7 sHPPs supported on this Project as shown on Table 2;
  - the 5 sHPPs that have been co-financed by the GoT in the order of USD 4.4 million (as shown on Table 4); and
  - the sHPPs whose operations have been restored (pertaining to those sHPPs under Recommendation 3) only under the condition where there are sufficient funds (from the Project or other sources).

While the Project cannot change and will not likely meet the 45 ktonnes CO<sub>2</sub> reduction target by the EOP, this calculation will provide an estimate of the achievable GHG reductions by the EOP;

- The only “clear and measurable” energy generation target is the “annual electricity generation from newly installed sHPPs by EOP” which is 2,430 MWh/yr. This target should be calculated by:
  - the energy generated by the new sHPPs constructed under Table 2 which only reaches 1,472 MWh/yr assuming the current EOP date of April 1, 2016. With an extension to June 30, 2017, the annual energy generation will reach 2,786 MWh/yr, exceeding the 2,430 MWh/yr target through the operation of Jilikul and Shurobod sHPPs;
  - the energy generated from the 5 sHPPs that have been supported through GoT co-financing in the order of USD 4.4 million (as shown on Table 4); the annual energy generation of these 5 sHPPs is estimated to be 10,338 MWh/yr;
  - if Recommendation 3 of restoring dysfunctional sHPPs is implemented, the annual energy generation can also be added towards achievement of the target. This would require changing of the indicator to “annual electricity generated from new sHPPs and restored sHPPs”;
- The target in Outcome 3 of “number of SHP demos/pilots incorporating aspects of productive uses and livelihood support for host communities” should be revised according to what is achievable with remaining Project resources. Instead of a target of 10 demos/pilots, the target should be revised to 7 demons/pilots according to the list on Table 2.

### 4.3 Lessons Learned

- Prior to the recruitment of consultants or companies for specialized technical assistance, the contracting office should have a roster of these entities or individuals to whom they could send an invitation to bid. On this Project, one year was lost in efforts to obtain the services of a technology-transfer consultant due to the lack of preparedness of Project Management to assess the market and find suitable entities who would be interested in the assignment. A valuable lesson was learned as Project Management was adequately prepared for the procurement of the services of a general contractor for the 2015 construction of 2 SHPs, and commenced the search for civil contractors as early as mid-2014. It appears that the early start in searching for these contractors will allow construction of the 2 SHPs to be completed before the winter season of 2015-16. However, in partial defence of the Project Management team in Tajikistan, the type of technology transfer services sought by this Project (i.e. technology owners transferring technology to a developing country) was unique with the expectation that the services were going to be difficult to source. Box 1 on pg 26 provides more details.
- The pre-requisite for designing a trust fund should be a sound strategic business plan for the use and the sustained replenishment of the fund. The work invested in the RE Trust Fund to date, unfortunately, has not resulted in a sound strategic business plan. The elements of the business plan for the RE Trust Fund are listed in Recommendation 5. If the strategic business plan can incorporate an IRD-based approach to sHPP development, it can serve as a basis for potential financiers to capitalize the Fund.

### 4.4 Ratings

These are summarized on Table 5.

**Table 5: MTR Ratings & Achievement Summary Table for Project**

Measure	MTR Rating	Achievement Description
Progress Towards Results	Goal: Reduction of GHG emissions from energy use by rural and remote communities <b>Achievement Rating: 2 (Unsatisfactory)</b>	The target for sHPPs was scaled back during the Inception Phase from 27 to 10 sHPPs to the current number of 7 sHPPs based on anticipated delays in building local manufacturing capacity. This scale-back has had the impact of reducing the achievable direct GHG emission reduction targets: <ul style="list-style-type: none"> <li>• Cumulative direct GHG reductions to end-of-project (EOP) of less than 2,000 tonnes CO<sub>2</sub> (based on current plans for developing 7 sHPPs plus the completion of 5 sHPPs developed and financed by the GoT ) in comparison to the cumulative EOP target of 45,000 tonnes CO<sub>2</sub>; and</li> <li>• Lifetime direct GHG reductions (assuming a 30-yr lifetime of the aforementioned sHPPs) of 59,910 tonnes CO<sub>2</sub> in comparison to the lifetime direct target of 244,000 tonnes CO<sub>2</sub></li> </ul>
	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	There has been moderately satisfactory progress in the removal of legal and regulatory barriers as well as capacity building for government personnel and personnel to accelerate the development of SHP. Capacity building for local workshops in Tajikistan involved in the supply chain for electro-mechanical equipment is progressing slowly due to initial problems sourcing appropriate technical assistance for the Project. There is a minor issue with the need for some clarity on the indicators for electricity generation of newly installed sHPPs. The outcome of these activities, however, has led to 50% of the sHPP power

	<p>fuels for power and other energy needs.  <b>Achievement Rating: 4 (Moderately Satisfactory)</b></p>	<p>generation targets being met after 31 months of Project activity.</p>
	<p>Outcome 1: Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country.  <b>Achievement Rating: 4 (Moderately Satisfactory)</b></p>	<ul style="list-style-type: none"> <li>• Substantial progress from the Project work on simplified procedures for the licensing and construction of sHPPs, adoption of the tariff methodology calculation, and the adoption and operationalization of the RES Law by 2013;</li> <li>• Training for government personnel on the application and processing of the RES Law for new sHPPs; and</li> <li>• Legal basis for a National Trust Fund for Renewable Energy (NTF) formed with the new Energy Efficiency and Energy Saving Law.</li> <li>• Progress on capitalization of the NTF, however, has been stalled due to the lack of a strategic plan for RE development, no stated purpose of the Fund, and the consequent reluctance of donors to capitalize the NTF.</li> </ul>
	<p>Outcome 2: Enhanced technical and planning know-how and developed market chain for SHP in Tajikistan  <b>Achievement Rating: 5 (Satisfactory)</b></p>	<p>Achievements of this outcome are characterized by</p> <ul style="list-style-type: none"> <li>• Timely completion of SHP development modules for use by SHP financers and developers in Tajikistan;</li> <li>• Timely introduction of the SHP development modules in the education system through the Tajik Technical University and the Tajik Energy Institute in Kurgantube;</li> <li>• Selection of two local manufacturing entities for the purposes of building their capacity for manufacturing electro-mechanical equipment for sHPPs;</li> <li>• Development and implementation of capacity development plans for technology transfer by Komperg, a Croatian company for manufacturing of turbines and other equipment for sHPPs that took one extra year due to difficulties in sourcing this type of expertise (i.e. a technology company willing to share if technology and have it manufactured in a developing country);</li> <li>• Delayed vocational training for SHP operational entities in the design, construction and O&amp;M of sHPPs; and</li> <li>• Efforts to build capacity of local manufacturers for production of electric and biomass heaters has been stalled due to the flooding of the Tajik market with less costly heating equipment.</li> </ul>
	<p>Outcome 3: Improved confidence on the technical and economic viability of integrated SHP-based rural development mod  <b>Achievement Rating: 5 (Satisfactory)</b></p>	<p>Achievements of this outcome are characterized by</p> <ul style="list-style-type: none"> <li>• Prefeasibility studies were prepared for 27 sites from which 10 sites were selected for feasibility studies and possible development;</li> <li>• District development plans completed;</li> <li>• Successful activities to bring the community-owned sHPP in Burunov jamoat to operate on a sustainable basis. Subsidies have recently been removed from the operations of this sHPP;</li> <li>• There is a signed PPA between the sHPP management team and Barki Tojik for the sale of excess electricity to the national grid; there was support for the development of a mini-dairy by the Burunov jamoat that used the electricity from the sHPP;</li> <li>• A minor issue exists with the target of 10 communities for SHP demos/pilots that incorporate IRD approaches. This target should be re-adjusted</li> </ul>

	<p>Outcome 4: National Scaling-up Programme of Renewable Energy-based Integrated Rural Development</p> <p><b>Achievement Rating: Cannot rate due to insufficient progress</b></p>	<p>There is progress on all outputs with the expectation that the outputs will be achieved by EOP.</p>
<b>Project Implementation &amp; Adaptive Management</b>	<p><b>Achievement Rating: 5 (Satisfactory)</b></p>	<p>Project has been effectively managed considering the challenges and actual progress to date. After Year 3, the Project is preparing for the construction of 2 sHPPs in 2015, and has managed to obtain an agreement on co-financing for capital cost of another 2 sHPPs from JICA. The current role of the CTA is assisting the Project to adaptively manage its activities including adjusting the Project's assistance towards the establishment of the National NTF.</p>
<b>Sustainability</b>	<p><b>2 (Moderately Unsustainable)</b></p>	<p>Mainly based substantial financial risks and risks related to the institutional framework and governance of the energy sector:</p> <ul style="list-style-type: none"> <li>• With electricity tariffs for sHPPs are not sufficient to induce investment, other sources of revenue are required to sustain SHP development in Tajikistan. The demonstration of the Project's approaches to finding the additional sources of revenue (i.e. through bilateral contracts with local businesses) are crucial to reducing financial risks to sustainability;</li> <li>• Capacity of government personnel to consistently apply the new RES Law and streamline the approvals of new sHPPs will not be sufficient by the EOP. More capacity building resources will be required after the EOP for this purpose;</li> <li>• Capacity of the local jamoats for implementing best practices for O&amp;M of sHPPs will not be sufficient by the EOP. More capacity building resources will be required after the EOP for O&amp;M training.</li> </ul>

# APPENDIX A – MISSION TERMS OF REFERENCE

## TERMS OF REFERENCE

### FOR

#### MID-TERM EVALUATION OF THE UNDP/GEF PROJECT:

### **PIMS 4324 - Project Title: Technology Transfer and Market Development for Small Hydropower in Tajikistan**

**Project Title:** Technology Transfer and Market Development for Small Hydropower in Tajikistan” - PIMS 4324

**Functional Titles:** International Consultant / Team Leader

**Duration:** estimated 20 working days  
over the period of: October 2014 - January 2015.

**Terms of Payment:** Lump sum payable upon satisfactory completion and approval by UNDP of all deliverables, including the Mid-Term Evaluation Report

**Travel costs:** The costs of in-country mission(s) of the consultant are to be included in the lump sum.

## 1. INTRODUCTION

In accordance with UNDP/GEF M&E policies and procedures, all full-size projects supported by the GEF should undergo a mid-term evaluation in the course of project implementation.

The Monitoring and Evaluation (M&E) policy at the project level in UNDP/GEF has four objectives:

- i) to monitor and evaluate results and impacts;
- ii) to provide a basis for decision making on necessary amendments and improvements;
- iii) to promote accountability for resource use; and
- iv) to document, provide feedback on, and disseminate lessons learned.

A mix of tools is used to ensure effective project M&E. These might be applied continuously throughout the lifetime of the project – e.g. periodic monitoring of indicators -, or as specific time-bound exercises such as mid-term reviews, audit reports and independent evaluations.

The evaluation is to be undertaken in accordance with the “GEF Monitoring and Evaluation Policy” (see <http://thegef.org/MonitoringandEvaluation/MEPoliciesProcedures/mepoliciesprocedures.html>).

This Mid-Term Evaluation is initiated by UNDP Country Office in Tajikistan and Bratislava Regional Centre as the GEF Implementing Agency for this project and it aims to provide managers (at the level of regulatory bodies of the Ministry of Energy and Water Resources of the Republic of Tajikistan, and UNDP/GEF) with a comprehensive overall assessment of the project and with a strategy for replicating the results. It also provides the basis for learning and accountability for managers and stakeholders.

## 2. PROJECT DESCRIPTION

Summary: The UNDP/GEF’s project of “Technology transfer and market development for SHP in Tajikistan” is a four-year project implemented directly by UNDP’s Energy and Environment Programme. The responsible national partner for the execution of the project is the Ministry of Energy and Water Resources of the Republic of Tajikistan. The project has a GEF budget of USD 2,000,000 and UNDP’s co-financing commitments of USD 1,330,000, and the potential co-financing commitments from the Government, private sector and other UNDP projects (including in-kind contribution) is USD 5,120,000. The Project Document was signed between the Ministry of Energy and Industry (currently the Ministry of Energy and Water Resources) of the Republic of Tajikistan and UNDP Country Office on 19 March 2012.

The aim of the project is to initiate UNDP Tajikistan’s strategy – the scaling up of pilot activities for the acceleration of progress towards the achievement of MDGs with a particular focus on improving access to renewable energy in rural regions for the purpose of poverty reduction and triggering economic development. Its conceptualization falls within the frame of the Poverty Reduction Strategy III and National Development Strategy, which have been recognized to have no focus on promoting use of abundant renewable potential for poverty reduction, development and building environmental resilience.

The project is expected to significantly accelerate the development of small-scale hydropower (SHP) generation in Tajikistan 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. The project aims to do this by introducing a regulatory framework to supply the grid with electricity generated SHP through sustainable delivery models and financing mechanisms and assist the Government in attracting funding for SHP investments.

The inception phase began in April 2012 and included an inception workshop several months later on September 28, 2012. The inception report documents the review of the project strategy and those changes made during the inception phase.

From the point of view of the design and implementation of the project, the key stakeholders are:

- Ministry of Energy and Water Resources of the Republic of Tajikistan (MoEWR)
- “Barki Tojik”, the national electricity utility company
- Agency for Hydrometeorology under the Committee for Environmental Protection
- Ministry of Economic Development and Trade (MEDT)



- Local production facilities and service providers (CJSC “Energoremont” and SUE “Tajiktekstilmash”)
- Academy of Science of the Republic of Tajikistan
- TajikGidroenergoProekt Research Institute
- Tajik Technical University
- Kurgantyube institute of energy
- Local government authorities at jamoat (sub-district,) district and regional levels
- Jamoat Resource Centers
- Micro Finance Institutions
- Non-governmental organizations
- UNDP Country Office
- UNDP/GEF Regional Center for Europe and CIS (Bratislava)
- The GEF Secretariat, who is not involved in project implementation, but to whom the Evaluation Report to be prepared under this Terms of Reference will be submitted.

Three project outcomes are defined in the Project Document:

1.	Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country.
2.	Enhanced technical and planning know-how and developed market chain for SHP.
3.	Demonstrated technical and economic viability of SHP technology in supporting socio-economic development.
4.	National Scaling-up Programme of Renewable Energy-based Integrated Rural Development in supporting socio-economic development.

Associated with these outcomes there are a number of Outputs (please see [Annex 1](#) for the Revised Logical Framework of the project). Progress towards them is reported in 2012-2013 Annual Project Implementation Review (to be available for the evaluation team).

### 3. OBJECTIVES OF THE EVALUATION

The evaluation is initiated and commissioned jointly by UNDP Tajikistan Country Office and by the UNDP/GEF Regional Coordination Unit (Bratislava). Mid-term evaluations (MTEs) are intended to identify potential project design issues, assess progress towards the achievement of objectives, identify and document lessons learned (including lessons that might improve design and implementation of other UNDP/GEF projects), and to make recommendations regarding specific actions that might be taken to improve the project. It is expected to serve as a means of validating or filling the gaps in the initial assessment of relevance, effectiveness and efficiency obtained from monitoring. The mid-term evaluation (MTE) provides the opportunity to assess early signs of project success or failure and prompt necessary adjustments. To this end, the MTE will serve to:

- Strengthen the adaptive management and monitoring functions of the project;
- Enhance the likelihood of achievement of the project and GEF objectives through analyzing project strengths and weaknesses and suggesting measures for improvement;
- Enhance organizational and development learning;

- Enable informed decision-making;
- Create the basis of replication of successful project outcomes achieved so far.

Particular emphasis should be put on the current project results and the possibility of achieving all the objectives in the given timeframe, taking into consideration the speed, at which the project is proceeding. More specifically, the evaluation should assess:

#### Project concept and design

The evaluation team will assess the project concept and design. The evaluation team should review the problem addressed by the project and the project strategy, encompassing an assessment of the appropriateness of the objectives, planned outputs, activities and inputs as compared to cost-effective alternatives. The executing modality and managerial arrangements should also be judged. The evaluation team will revise and re-assess the relevance of indicators and targets, review the work plan, planned duration and budget of the project.

#### Implementation

The MTE will assess the implementation of the project in terms of quality and timeliness of inputs and efficiency and effectiveness of activities carried out. Also, the effectiveness of management as well as the quality and timeliness of monitoring and backstopping by all parties to the project should be evaluated. In particular the MTE is to assess the Project Management Unit's use of adaptive management in project implementation.

#### Project outputs, outcomes and impact

The MTE will assess the outputs, outcomes and impact achieved by the project as well as the likely sustainability of project results. MTE should encompass an assessment of the achievement of the immediate objectives and the contribution to attaining the overall objective of the project. The evaluation team should also assess the extent to which the implementation of the project has been inclusive of relevant stakeholders and to which it has been able to create collaboration between different partners. The evaluation team will also examine if the project has had significant unexpected effects, whether of beneficial or detrimental character.

Project progress will be measured based on Project Logical Framework (see [Annex 1](#)), which provides clear performance and impact indicators for project implementation along with their corresponding means of verification.

**The evaluation will assess the aspects as listed in evaluation report outline attached in [Annex 2](#).**

## **4. DETAILED SCOPE OF WORK**

The Evaluation Team will look at the following aspects:

### **1. Project concept/design, relevance and strategy**

*1.1 Project relevance, country ownership/drivenness (R):* the extent to which the project is suited to local and national development priorities and organizational policies, including changes over time as well as the extent the activities contribute towards attainment of global environmental benefits:

- Is the project concept in line with the sectoral and development priorities and plans of the country?

- Are project outcomes contributing to national development priorities and plans?
- How and why project outcomes and strategies contribute to the achievement of the expected results?
- Examine their relevance and whether they provide the most effective way towards results.
- Do the outcomes developed during the inception phase still represent the best project strategy for achieving the project objectives (in light of updated underlying factors)? If no, please come up with suggestions and recommendations.

#### 1.2 Preparation and readiness:

- Are the project's objectives and components clear, practicable and feasible within its timeframe?
- Were the capacities of executing institution and counterparts properly considered when the project was designed?
- Were lessons from other relevant projects properly incorporated in the project design?
- Were the partnership arrangements properly identified?
- Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?

#### 1.3 Stakeholder involvement (R):

- Did the project involve the relevant stakeholders through information-sharing, consultation and by seeking their participation in the project design?
- Did the project consult and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the design of project activities?

#### 1.4 Underlying factors/assumptions:

- Assess the underlying factors beyond the project's immediate control that influence outcomes and results. Consider the appropriateness and effectiveness of the project's management strategies for these factors.
- Re-test the assumptions made by the project management and identify new assumptions that should be made.
- Assess the effect of any incorrect assumptions made by the project.

#### 1.5 Management arrangements (R):

- Were the project roles properly assigned during the project design?
- Are the project roles in line with UNDP and GEF programming guidelines?
- Can the management arrangement model suggested by the project be considered as an optimum model? If no, please come up with suggestions and recommendations.

#### 1.6 Project budget and duration (R):

- Assess if the project budget and duration were planned in a cost-effective way?

#### 1.7 Design of project M&E system (R):

- Examine whether or not the project has a sound M&E plan to monitor results and track progress towards achieving project objectives.
- Examine whether or not the M&E plan includes a baseline (including data, methodology, etc.), SMART indicators and data analysis systems, and evaluation studies at specific times to assess results and adequate funding for M&E activities.

- Examine whether or not the timeframe for various M&E activities and standards for outputs are specified.

### 1.8 Sustainability:

- Assess if project sustainability strategy was developed during the project design?
- Assess the relevance of project sustainability strategy

## 2. Project implementation

### 2.1 Project's adaptive management (R):

- Monitoring systems
  - Assess the monitoring tools currently being used:
    - Do they provide the necessary information?
    - Do they involve key partners?
    - Are they efficient?
    - Are additional tools required?
  - Assess the use of the logical framework as a management tool during implementation and any changes made to it.
  - What impact did the retrofitting of impact indicators have on project management, if such?
  - Assess whether or not M&E system facilitates timely tracking of progress towards project's objectives by collecting information on chosen indicators continually; tracking tools are finalized properly, the information provided by the M&E system is used to improve project performance and to adapt to changing needs.
- Risk Management
  - Validate whether the risks identified in the project document and PIRs are the most important and whether the risk ratings applied are appropriate. If not, explain why.
  - Describe any additional risks identified and suggest risk ratings and possible risk management strategies to be adopted.
- Work Planning
  - Assess the use of routinely updated workplans.
  - Assess the use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
  - Are work planning processes result-based<sup>44</sup>? If not, suggest ways to re-orientate work planning.
- Financial management
  - Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions. (Cost-effectiveness: the extent to which results have been delivered with the least costly resources possible.). Any irregularities must be noted.
  - Is there due diligence in the management of funds and financial audits?
  - Did promised co-financing materialize (please fill out the co-financing form provided in Annex 2)?
- Reporting
  - Assess how adaptive management changes have been reported by the project management.

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<sup>44</sup> RBM Support documents are available at <http://www.undp.org/eo/methodologies.htm>

- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.
- Delays
  - Assess if there were delays in project implementation and what were the reasons.
  - Did the delay affect the achievement of project's outcomes and/or sustainability, and if it did then in what ways and through what causal linkages?

### 2.2 Stakeholder participation, partnership strategy (R):

- Assess whether or not and how local stakeholders participate in project decision-making.
- Does the project consult and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the implementation of project activities?
- Consider the dissemination of project information to partners and stakeholders and if necessary suggest more appropriate mechanisms.
- Identify opportunities for stronger partnerships.

### 2.3 Sustainability:

- Assess the extent to which the benefits of the project will continue, within or outside the project scope, after it has come to an end; commitment of the government to support the initiative beyond the project.
- The evaluators may look at factors such as mainstreaming project objectives into the broader development policies and sectoral plans and economies.

The sustainability assessment will give special attention to analysis of the risks that are likely to affect the persistence of project outcomes. The sustainability assessment should also explain how other important contextual factors that are not outcomes of the project will affect sustainability. The following four dimensions or aspects of sustainability will be addressed:

- *Financial resources:* Are there any financial risks that may jeopardize sustenance of project outcomes? What is the likelihood of financial and economic resources not being available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)?
- *Socio-political:* Are there any social or political risks that may jeopardize sustenance of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project?
- *Institutional framework and governance:* Do the legal frameworks, policies and governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems for accountability and transparency, and the required technical know-how are in place.
- *Environmental:* Are there any environmental risks that may jeopardize sustenance of project outcomes?

On each of the dimensions of sustainability of the project outcomes will be rated as follows:

- *Likely (L):* There are no or negligible risks that affect this dimension of sustainability.
- *Moderately Likely (ML):* There are moderate risks that affect this dimension of sustainability.
- *Moderately Unlikely (MU):* There are significant risks that affect this dimension of sustainability

- *Unlikely (U)*: There are severe risks that affect this dimension of sustainability.

### 3. Project results (outputs, outcomes and objectives)

#### 3.1 Progress towards achievement of intended outputs, outcomes/measurement of change:

Progress towards results should be based on a comparison of indicators before and after (so far) the project intervention, e.g. by comparing current conditions for SHP development (legal and regulatory frameworks, local capacities for managing and operating the SHPs, producing SHP equipment and results, etc.) to the baseline ones.

The evaluation should, inter alia, look into:

- Adequacy of the level and proposed modes of enforcement of the regulatory, policy and programmatic documents developed within the project for creating of SHP enabling environment;
- Verification of the GHG emissions reduction and the impact the SHPs may have on the GHG emissions reduction;
- Verification of the Government commitment towards contributing to the development of SHPs through the adopted and financed SHP projects within the project implementation period;
- Validation of the adequacy and viability of the approaches applied within the project;

To determine the level of achievement of project outcomes and objectives following three criteria should be assessed:

- *Relevance*: Are the project's outcomes consistent with the focal areas/operational program strategies and country priorities?
- *Effectiveness*: Are the actual project outcomes commensurate with the original or modified project objectives? In case the original or modified expected results are merely outputs/inputs then the evaluators should assess if there are any real outcomes of the project and if yes then whether these are commensurate with the realistic expectations from such a project.
- *Efficiency*: Is the project cost effective? Wherever possible, the evaluator should also compare the cost-time vs. outcomes relationship of the project with that of other similar projects.

Outcomes should be rated as follows for relevance, effectiveness, efficiency:

- *Highly Satisfactory (HS)*: The project has no shortcomings in the achievement of its objectives.
- *Satisfactory (S)*: The project has minor shortcomings in the achievement of its objectives.
- *Moderately Satisfactory (MS)*: The project has moderate shortcomings in the achievement of its objectives.
- *Moderately Unsatisfactory (MU)*: The project has significant shortcomings in the achievement of its objectives.
- *Unsatisfactory (U)*: The project has major shortcomings in the achievement of its objectives.
- *Highly Unsatisfactory (HU)*: The project has severe shortcomings in the achievement of its objectives.

In addition to a descriptive assessment, criteria should be rated using the rating scales as in GEF Evaluation guidelines (<http://www.thegef.org/gef/sites/thegef.org/files/documents/Policies-TEguidelines7-31.pdf>). The guidelines use the 6-point satisfaction and 5-point sustainability scales are defined in Table 1.2 and Table 1.3 of [Annex 4](#) respectively. Thus, the Project objective and outcomes are to be rated in accordance with their respective measurable indicators, as well as for each of its components, using a 6-point scale that is defined in Table 1.2. Other aspects of the Project's objective (relevance, effectiveness, efficiency and impact) and sustainability of its outcomes are rated,

respectively, according to satisfaction and sustainability scales. Also the Overall Rating of the project should be indicated.

## 5. PRODUCTS EXPECTED FROM THE EVALUATION

The key product expected from this mid-term evaluation is a comprehensive analytical report in English that should, at least, follow minimum GEF requirements as indicated in [Annex 2](#).

The Report of the Mid-Term Evaluation will be stand-alone document that substantiates its recommendations and conclusions. The report will have to provide to the GEF Secretariat complete and convincing evidence to support its findings/ratings.

The Report will include a table of planned vs. actual project financial disbursements, and planned co-financing vs. actual co-financing in this project, according the table attached in [Annex 3](#) of this TOR

The Report will be supplemented by Rate Tables, attached in [Annex 4](#) of this TOR.

The length of the mid-term evaluation report shall not exceed 30 pages in total (not including annexes).

## 6. EVALUATION APPROACH

An outline of an evaluation approach is provided below; however it should be made clear that the evaluation team is responsible for revising the approach as necessary. Any changes should be in-line with international criteria and professional norms and standards. They must be also cleared by UNDP before being applied by the evaluation team.

The evaluation must provide evidence-based information that is credible, reliable and useful. It must be easily understood by project partners and applicable to the remaining period of project duration.

The evaluation should provide as much gender disaggregated data as possible.

The evaluation will take place mainly in the field. The evaluation team is expected to follow a participatory and consultative approach ensuring close engagement with the government counterparts, UNDP CO, Steering Committee, project team, and key stakeholders.

The evaluation team is expected to consult all relevant sources of information, such as the project document, project reports – incl. Annual Reports, outcome/component level reports, project files, strategic and legal documents. The list of documentation to be reviewed is included in [Annex 5](#) of this Terms of Reference.

The evaluation team is expected to use interviews as a means of collecting data on the relevance, performance and success of the project. S/He is also expected to visit the project sites.

In preparation for the evaluation mission, the project manager, with assistance from UNDP country office, will arrange for the completion of the tracking tool (in currently valid GEF tracking tool template). The Tracking tool will be completed/endorsed by the relevant implementing agency or qualified national research /scientific institution, and not by the international consultant or UNDP staff. The

tracking tool will be submitted to the international evaluation consultant, who will need to provide his/her comments on it. Upon incorporation of the comments from the international evaluation consultant to the tracking tool, it will be finalized and attached as mandatory annex to the MTE report.

The methodology to be used by the evaluation team should be presented in the report in detail. It shall include information on:

- Documentation reviewed;
- Interviews;
- Field visits;
- Questionnaires;
- Participatory techniques and other approaches for the gathering and analysis of data.

***Although the Evaluation Team should feel free to discuss with the authorities concerned, all matters relevant to its assignment, it is not authorized to make any commitment or statement on behalf of UNDP or GEF or the project management.***

The Evaluation Team should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

## 7. DUTIES, SKILLS AND QUALIFICATIONS OF THE EVALUATION TEAM

### International Consultant

#### Duties and Responsibilities:

- Desk review of documents, development of draft methodology, detailed work plan and MTE outline (maximum 4-day homework);
- Debriefing with UNDP CO, agreement on the methodology, scope and outline of the MTE report (1 day);
- Interviews with project implementing partner (executing agency), relevant Government, NGO and donor representatives and UNDP/GEF Regional Technical Advisor (maximum 3 days);
- Field visit to the pilot project site and interviews (2 days);
- Debriefing with UNDP (1 day);
- Development and submission of the first MTE report draft (maximum of 4 days). Submission is due on the 16-th day of the assignment. The draft will be shared with the UNDP CO, UNDP/GEF (UNDP/GEF RCU Bratislava) and key project stakeholders for review and commenting;
- Finalization and submission of the final MTE report through incorporating suggestions received on the draft report (maximum 5 days);
- Supervision of the work of the national consultant (during entire evaluation period).

#### Competencies

##### Corporate Competencies

- Demonstrates integrity by modelling the UN's values and ethical standard;



- Promotes the vision, mission, and strategic goals of UNDP and GEF;
- Displays cultural, gender, religion, race, nationality, and age sensitivity and adaptability;
- Treats all people fairly without favouritism.

### **Functional Competencies**

- Knowledge and experience with programming development, monitoring and evaluation;
- Consistently approaches work with energy and a positive, constructive attitude;
- Demonstrates openness to change, flexibility, and ability to manage complexities;
- Ability to work under pressure and with multi-disciplinary and multicultural teams and possess excellent inter-personal skills;
- Demonstrates strong written and oral communication skills;
- Remains calm, in control, and good humoured even under pressure;
- Proven networking, team-building, organizational and communication skills;
- Ability to establish priorities for self and others, and to work independently.

### **Skills and Experience:**

#### **A. Academic Qualification**

- Master's degree in Renewable Energy Sources Management, Natural Resource Management, Environmental Economics, Physics or other related areas; **(Criteria A)**

#### **B. Experience**

- A Minimum of 7 years working experience in providing management or consultancy services to the Renewable Energy and Energy Efficiency projects, preferably with components on small hydropower plants development; **(Criteria B)**
- Experience in monitoring and evaluating renewable energy related projects for UN or other international development agencies (at least in one project); **(Criteria B)**
- Recent knowledge of the GEF Monitoring and Evaluation Policy; **(Criteria B)**
- Recent knowledge of UNDP's results-based management policies and procedures; **(Criteria C)**
- Recognized expertise in the renewable energy and energy efficiency and excellent understanding of climate change issues; **(Criteria C)**
- Familiarity with renewable energy and energy efficiency in CIS would be an asset; **(Criteria C)**

#### **C. Language**

- Fluent in English both written and spoken; **(Criteria E)**
- Fluency in Russian is an asset; **(Criteria E)**

### **National Consultant**

#### **Duties and Responsibilities**

- Collection of background materials upon request by Evaluation Team Leader/International Consultant;

- Provision of important inputs in developing methodologies, work plans and evaluation report outlines;
- Desk review of materials;
- Participation in debriefings with UNDP CO representatives;
- Assistance to the Evaluation Team Leader in conducting interviews with relevant stakeholders; provide both oral and written translation from/to English/Russian/Tajik, whenever necessary;
- Field visit and assistance to the Evaluation Team Leader in interviewing local stakeholders at project sites;
- Participation in debriefing with UNDP and project implementing partners;
- Assistance to the Evaluation Team Leader in developing the first draft of the MTE report;
- Assistance to the Evaluation Team Leader in finalization of the Mid-Term Evaluation report.

National Consultant will assist International Consultant with the oral and written translation between English and Russian/Tajik as required. The National Consultant will work closely with the International Consultant and coordinate all activities with the responsible staff of the project, Ministry of Energy and Water Resources, Programme Unit of the UNDP Country Office. Travels are also planned in the due course to the project sites throughout the country.

#### Required Qualifications:

##### 1. Education

- Advanced university degree in social sciences or other related field. Postgraduate degree(s) will be an advantage;

##### 2. Experience

- Minimum 3 years of relevant experience, preferably in the field of renewable energy development;
- Previous experience with the development projects implementation, monitoring and evaluation;
- Participation in the similar evaluations in the past is a strong advantage;
- Proven analytical skills;
- Good interpersonal, communication, facilitation and presentation skills;

##### 3. Language and computer skills

- Fluency in English, Russian and Tajik both written and spoken is essential;
- **Computer literacy.**

## 8. IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation lies with UNDP Country Office (UNDP CO) in Tajikistan. UNDP CO will contract the evaluation team. The responsible staff of the project and UNDP will be responsible for liaising with the Evaluation Team to provide the project documentation, set up stakeholder interviews, arrange field visits, coordinate with the government counterparts, etc.

The evaluation will be conducted within the period of **September - October 2014.**

The activity and tentative timeframe are broken down as follows:

Activity	Timing	Estimated duration
Desk review	September 2014	2 days
Briefings for evaluators by UNDP CO and UNDP EEP	Till 29 September 2014	1 day
Field visits, interviews, questionnaires, de-briefings, presentation of main findings	end September – early October	10 days
Drafting of the evaluation report	Within 10 working days after the mission	3 days
Validation of preliminary findings with stakeholders through circulation of draft reports for comments, meetings and other types of feedback mechanisms	Till 25 <sup>th</sup> October 2014	2 days
Finalization of the evaluation report (incorporating comments received on first draft)	Till 30 <sup>th</sup> November 2012	2 days
		<b>20 days</b>

The report (draft and final version) shall be submitted to the UNDP Country Office in Tajikistan.

Prior to approval of the final report, UNDP contact person will circulate the draft for comments to government counterparts and project management: responsible staff of the project, UNDP Country Office in Tajikistan, Ministry of Energy and Water Resources of the Republic of Tajikistan, UNDP/GEF RTA.

**UNDP and the stakeholders will submit comments and suggestions** within 10 working days after receiving the draft.

**The finalised Evaluation Report shall be submitted latest on 10 November 2014.**

If any discrepancies have emerged between impressions and findings of the evaluation team and the aforementioned parties, these should be explained in an annex attached to the final report.

## 9. APPLICATION PROCESS

Applicants are requested to apply online on [www.undp.tj](http://www.undp.tj) by **5<sup>th</sup> August 2014, 12:00 CET**

**The application should contain** current and complete C.V. in English with indication of the e-mail and phone contact.

Shortlisted candidates will be invited to present a price offer indicating the total cost in USD of the assignment (including the daily fee, per diem and travel costs) preferably according the template attached in [Annex 6](#))

*UNDP applies fair and transparent selection process that would take into account the competencies/skills of the applicants as well as their financial proposals.*

*Qualified women and members of social minorities are encouraged to apply.*

*UNDP is a non-smoking work environment.*

*Due to large number of applicants, UNDP regrets that it is unable to inform the unsuccessful candidates about the outcome or status of the recruitment process.*

## APPENDIX B – MISSION ITINERARY (FOR NOVEMBER 24 – DECEMBER 3, 2014)

The mid-term review mission was conducted by Mr. Roland Wong, International Consultant and Mr. Furugzod Usmanov, National Consultant in accordance with the objectives of the midterm review and obtained data relevant for making judgments regarding Project success and lessons learned.

<b>November 24, 2014 (Monday)</b>			
#	Activity	Stakeholder involved	Place
	Arrival of Mr. Roland Wong		
1	Meeting with UNDP Project staff including Mr. Jamshed Kodirkulov, Project Manager, UNDP EEP and Mr. Paata Janalidze, CTA on final schedule of mission meetings, project debriefing, and project management issues	UNDP	Dushanbe
<b>November 25, 2014 (Tuesday)</b>			
2	Skype call with Ms. Nargiza Usmanova and Mr. Khurshed Kholov of UNDP on Project background and macro-issues	UNDP	Dushanbe
3	Meetings with donor community committee to discuss minimization of door overlaps on energy sector projects	World Bank, IFC, ADB, EBRD, GIZ, EU, USAID, OSCE, KfW	Dushanbe
4	Meeting with Mr. Ruslan Sharipov of Barki Tojik	Barki Tojik	Dushanbe
<b>November 26, 2014 (Wednesday)</b>			
5	Meeting with Mr. Furkat Kadyrov, Energy Sector Consultant	MoEWR and World Bank	Dushanbe
6	Meeting with Mr. Halim on MoF views on sHPP investments by the Government	Ministry of Finance	Dushanbe
<b>November 27, 2014 (Thursday)</b>			
7	Meeting with Mr. Pulat Muhiddinov, Deputy Ministry of MoEWR	MoEWR	Dushanbe
8	Meeting with Mr. Vais Tilloev, Head of Electroenergy Unit of MoEWR	MoEWR	Dushanbe
9	Meeting with Ms. Roza Khoshmukhamedova, Director of Energoremont (EN) workshop	Energoremont	Dushanbe
10	Meeting with Mr. Talbakov, Director of Tajiktekstilmash (KM) workshop	Tajiktekstilmash	Dushanbe
<b>November 28, 2014 (Friday)</b>			
	Field trip to Nurofar sHPP in Burunov jamoat near Vahdat		

11	Skype call with Dr. Kristian Horvat, Komperg on technology transfer program with EN and KM	UNDP	Dushanbe
<b>November 29-30, 2014 (Saturday and Sunday)</b>			
	Preparing MTR report		
<b>December 1, 2014 (Monday)</b>			
12	Meeting with Ms. Kristin Laabs, Director of KfW Office in Dushanbe	KfW	Dushanbe
13	Meeting with Mr. Adderavakhmanov Abdukarim and Mr. Rustamov Turaqul, on SHP education modules on SHP.	Tajik Technical University	Dushanbe
<b>December 2, 2014 (Tuesday)</b>			
	Field trip to Romit Region to view Sorbo sHPP (2 x 15 kW)		
<b>December 3, 2014 (Wednesday)</b>			
14	De-briefing meeting of MTR with Mr. Khurshed Kholov, UNDP	UNDP	Dushanbe
<b>December 4, 2014 (Thursday)</b>			
	Departure from Dushanbe		

Total number of meetings conducted: 14

## APPENDIX C – LIST OF PERSONS INTERVIEWED AND DOCUMENTS REVIEWED

This is a listing of persons contacted in Dushanbe (unless otherwise noted) during the midterm review period for the MTR only. The midterm review team regrets any omissions to this list.

- 1) Ms. Nargiza Usmanova, Programme Analyst, UNDP
- 2) Mr. Khurshed Kholov, EEP Programme Manager, UNDP
- 3) Mr. Jamshed Kodirkulov, Project Manager, TTP Project, UNDP
- 4) Mr. Paata Janalidze, CTA, TT Project
- 5) Ms. Violetta Strizhakova, Resident Engineer, EEP, UNDP
- 6) Dr. Kristijan Horvat, Technology Transfer Consultant, Komperg, TT Project
- 7) Mr. Pulat Muhiddinov, Deputy Ministry, MoEWR
- 8) Mr. Vais Tilloev, Head of Electroenergy Unit, MoEWR
- 9) Mr. Furkat Kadyrov, Energy Sector Consultant, World Bank and MoEWR
- 10) Mr. Halim, MoF
- 11) Mr. Ruslan Sharipov, Barki Tojik
- 12) Ms. Roza Khoshmukhamedova, Director, Energoremont (EN) workshop
- 13) Mr. Talbakov, Director, Tajiktekstilmash (KM) workshop
- 14) Ms. Kristin Laabs, Director, KfW Office in Dushanbe
- 15) Mr. Adderavakhmanov Abdugarim, Tajik Technical University
- 16) Mr. Rustamov Turaqul, Tajik Technical University
- 17) Ms. Ilze Purina, Finance Expert, EU-funded Sustainable Energy Programme for Central Asia: Renewable Energy Resources and Energy Efficiency (CASEP)

Documents reviewed for this MTR includes:

- 1) Project Document
- 2) UNDP reports
  - a. Quarterly Progress Monitoring Matrix Reports from 2012 to 2014
  - b. Minutes from Project Steering Committee Meetings 2013 and 2014
  - c. Project Inception Report October 2012
- 3) CTA Mission Reports from March 2014 and June 2014
- 4) GHG Emissions Report for TT Project, September 2014
- 5) Project Tracking Tool
- 6) Komperg Reports including Inception Report (March 2014), Progress Report (July 2014)

## APPENDIX D – PROJECT PLANNING MATRIX

Co-financing (type/source)	UNDP own financing (mill. USD)		Government (mill. USD)		Partner Agency (mill. USD)		Total (mill. USD)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	1.330	0.710 <sup>45</sup>					1.330	0.710
Loans/Concessions								
• In-kind support	3.420	0.500	1.700	0.142 <sup>46</sup>			5.120	0.642
• Other				4.400 <sup>47</sup>		0.180 <sup>48</sup>		4.580
Totals	4.750	1.210	1.700				6.450	5.932

<sup>45</sup> Estimated costs of purchasing equipment for ER and KM, and project operating expenses

<sup>46</sup> In-kind support from ER and KM

<sup>47</sup> Government financing of 5 sHPPs with installed capacity of 1,967 kW

<sup>48</sup> Technical assistance from Eurasian Development Bank



## APPENDIX E – PROJECT PLANNING MATRIX

Strategy	Indicator	Baseline	Targets	Means of Verification	Risks and Assumptions
Goal: Reduction of GHG emissions from energy use by rural and remote communities	Avoided GHG emissions from rural communities' energy use by end of project (EOP), ktCO2	0	45 ktCO2	Project Annual reports; GHG emissions monitoring and verification reports, final evaluation	No change in positive Government policies concerning SHP development and utilization
	Avoided GHG emissions from rural communities' energy use by end of project influence period, 10 years (EOPIP), ktCO2	0	244 ktCO2		
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.	<ul style="list-style-type: none"> <li>• No. of new small hydropower projects under implementation by EOP</li> <li>• Minimum No. of fully operational SHPs by EOP</li> <li>• Cumulative electricity generation from newly installed SHPs by EOP, MWh/yr</li> <li>• Cumulative electricity generation from newly installed SHPs by EOPIP, MWh/yr</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 0<sup>49</sup></li> <li>• 0</li> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 10<sup>50</sup></li> <li>• 5</li> <li>• 2,430</li> <li>• 6,500</li> </ul>	Individual SHP project reports, Performance reports of operational SHPs; Project's annual reports, GHG monitoring and verification reports. Project final evaluation report.	Continued commitment of project partners, including Government agencies and investors/developers
<b>Outcomes</b>					
Outcome 1: Adapted and enhanced legislative and regulatory framework for small-scale hydropower development in the country.	<ul style="list-style-type: none"> <li>• Adopted regulation operationalizing RES Law</li> </ul>	No regulations in support of RES Law	Rules and regulations adopted by end of Year 1	Published documents. Government decrees/laws. Project progress reports	Commitment of the various Government institutions to adopt and capacities to enforce required bylaws are in place;

<sup>49</sup> Many SHP constructed in the past are malfunctioning; none connected to the grid and few investments in SHP take place, except for by isolated donor-funded projects

<sup>50</sup> The projects are in various stages of development (assessment, feasibility, construction, operation)

Strategy	Indicator	Baseline	Targets	Means of Verification	Risks and Assumptions
					Low turn-over of trained government staff
Output 1.1: Formulated, approved and enforced implementing rules and regulations (IRRs) of the new Law for RES that will facilitate actions geared towards the enhancement of the market environment for SHP	<ul style="list-style-type: none"> <li>Simplified procedures and principles for the licensing and construction of SHP facilities</li> <li>National RE/EE Fund</li> </ul>	<ul style="list-style-type: none"> <li>RES Law includes a number of provisions to facilitate investment in grid-connected RE projects, but they are not operationalized</li> </ul>	<ul style="list-style-type: none"> <li>Procedures adopted by end of Year 1</li> <li>National RE/EE Fund set-up and is operational by end of Year 2</li> </ul>	<ul style="list-style-type: none"> <li>Published IRRs</li> <li>Project report documenting the status of IRRs enforcement</li> <li>Project report on the status of operations of RE and EE Fund</li> <li>Same as above</li> <li>Same as above</li> </ul>	<ul style="list-style-type: none"> <li>Commitment of the various Government institutions to adopt and capacities to enforce required bylaws are in place</li> </ul>
Output 1.2: Central and local government institutions with enhanced capacities to develop and coordinate SHP projects.	<ul style="list-style-type: none"> <li># staff members from relevant central and local government institutions trained in developing and coordinating SHP projects</li> </ul>	<ul style="list-style-type: none"> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>30 staff members trained by the end of Year 2</li> </ul>	<ul style="list-style-type: none"> <li>Training reports</li> </ul>	<ul style="list-style-type: none"> <li>Low turn-over of trained central and municipal staff is ensured</li> </ul>
Outcome 2: Enhanced technical and planning know-how and developed market chain for SHP in Tajikistan	<ul style="list-style-type: none"> <li>% of the total SHP installed cost provided by locally made goods and services</li> </ul>	<ul style="list-style-type: none"> <li>5-10%</li> </ul>	<ul style="list-style-type: none"> <li>50% by the end of Year 4</li> </ul>	<ul style="list-style-type: none"> <li>Project report on SHP market chain development</li> </ul>	<ul style="list-style-type: none"> <li>Potential market chain actors are interested in SHP projects</li> <li>Demand for SHP is on the rise as a result of establishing favorable policy framework</li> </ul>
Output 2.1: Guidebook on technical and policy aspects of SHP project development (to be used in all trainings to be delivered by the project)	<ul style="list-style-type: none"> <li>Guidebook on SHP project development</li> </ul>	<ul style="list-style-type: none"> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>Guidebook on SHP project development prepared and disseminated by the end of Year 1</li> </ul>	<ul style="list-style-type: none"> <li>Published capacity needs assessment</li> <li>Training reports</li> <li>Same as above</li> </ul>	<ul style="list-style-type: none"> <li>Commitment of partners to release staff for training program is in place</li> <li>Commitment of universities and technical school to introduce new curricula is in place</li> </ul>

Strategy	Indicator	Baseline	Targets	Means of Verification	Risks and Assumptions
				<ul style="list-style-type: none"> <li>• Same as above</li> <li>• Same as above</li> </ul>	
Output 2.2: Local workshops and manufacturers with enhanced capacities to install, construct, manufacture and repair SHP system equipment and components	<ul style="list-style-type: none"> <li>• Technology transfer and capacity development plan prepared for selected local manufacturers</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 2 technology transfer and capacity development plan prepared by the end of Year 1</li> </ul>	<ul style="list-style-type: none"> <li>• Project report on SHP market chain development</li> </ul>	<ul style="list-style-type: none"> <li>• Interest of potential SHP market chain actors in provided capacity building and technology transfer is insured</li> </ul>
Output 2.3: Vocational training program for technicians involved in SHP design/construction and O&M	<ul style="list-style-type: none"> <li>• # of technicians annually undertaking vocational training on SHP</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 20 technicians annually undertaking vocational training on SHP starting from Year 2</li> </ul>	<ul style="list-style-type: none"> <li>• Training report</li> </ul>	<ul style="list-style-type: none"> <li>• Interest of local education institutions</li> </ul>
Output 2.4: Local manufacturers capable of producing combined electric and biomass-fired heating and cooking devices for rural households	<ul style="list-style-type: none"> <li>• # of local craft workshops capable of manufacturing and assemblage of simple, efficient and low-cost electric heating and cooking devices</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• At least 1 local craft workshops by the end of Year 3<sup>51</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Project report</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
Outcome 3: Improved confidence on the technical and economic viability of integrated SHP-based rural development model	<ul style="list-style-type: none"> <li>• No. of SHP demos/pilots incorporating aspects of productive uses and livelihood support for host communities</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• At least 5 community-owned SHP projects operate on a sustainable basis and at least 5 additional are under construction by the end of Year 4</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Reports on pilot SHPs operations</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of local people with sufficient technical education and managerial experience</li> <li>• Participation of local level government</li> </ul>
Output 3.1: Technical studies, political commitments		<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>• FS for 2 sites by end of Year 1, 3 sites - by end</li> </ul>	<ul style="list-style-type: none"> <li>• Report on implementation of pilot SHP projects</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>

<sup>51</sup> Depending on the results of market and feasibility analysis the workshop may or may not be created. The Chinese goods are highly competitive in the local markets.

Strategy	Indicator	Baseline	Targets	Means of Verification	Risks and Assumptions
and institutional framework secured for pilot SHP projects	<ul style="list-style-type: none"> <li>Feasibility studies</li> <li>No. of integrated district development plans (IDDPs)</li> <li>No. of SHP projects in the pipe-line</li> </ul>	<ul style="list-style-type: none"> <li>0</li> <li>0</li> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>of Year 2, 5 sites - by end of Year 3</li> <li>IDDP for 2 districts by end of Year 2, 3 districts - by end of Year 3</li> <li>At least 5 further SHP projects identified and construction started (without direct project support)</li> </ul>	Integrated District Development Plans	
Output 3.2: Operational SHP demos/pilots in selected communities, demonstrating the viability of the technology and O&M&M models	<ul style="list-style-type: none"> <li>No. of operational demo/pilot SHP plants by EOP <ul style="list-style-type: none"> <li></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>0</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>5</li> <li></li> </ul>	Report on implementation of pilot SHP projects	Same as above
Output 3.3: Pilot SHP operations sustained	<ul style="list-style-type: none"> <li>No. of PPAs signed for purchase of power from pilot SHP plants by EOP</li> <li>No. of local business supported in pilot localities</li> </ul>	<ul style="list-style-type: none"> <li>0</li> <li>0</li> <li>0</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>At least 2 by the end of Year 3</li> <li>5 by the end of Year 4</li> <li></li> </ul>	Report on implementation of pilot SHP projects	Same as above
Outcome 4: National Scaling-up Programme of	<ul style="list-style-type: none"> <li>Adopted and financed National Scaling-up</li> </ul>	N/a	<ul style="list-style-type: none"> <li>Adopted and financed National Scaling-up</li> </ul>	<ul style="list-style-type: none"> <li>Officially approved and published national</li> </ul>	<ul style="list-style-type: none"> <li>Data on project impacts and results properly</li> </ul>

Strategy	Indicator	Baseline	Targets	Means of Verification	Risks and Assumptions
Renewable Energy-based Integrated Rural Development	Program		Program by the end of Year 4	scaling up plan	documented and made available to consultants
Output 4.1: Project results assessed, analyzed and compiled into comprehensive national report	<ul style="list-style-type: none"> <li>Project results and Lessons learnt report</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Project results and Lessons learnt report prepared by end of Year 4</li> </ul>	<ul style="list-style-type: none"> <li>Project results and Lessons learnt report</li> <li>Project report on GHG emission reduction monitoring</li> </ul>	Data on project impacts and results properly documented and made available to consultants
Output 4.2: Conference on integrated renewable-energy based rural development organized	<ul style="list-style-type: none"> <li>Conference on integrated renewable-energy based rural development</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Conference on integrated renewable-energy based rural development organized by the end of Year 4</li> </ul>	<ul style="list-style-type: none"> <li>Conference report</li> </ul>	Data on project impacts and results properly documented and made available to consultants
Output 4.3 Approved and funded proposal for national scaling up of the SHP demos/pilots	<ul style="list-style-type: none"> <li>Annual amount of governmental incentives allocated to support investment in new SHP plants under the scale-up plan by EOP, US\$</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>3,500,000 US\$</li> </ul>	<ul style="list-style-type: none"> <li>Officially approved and published national scaling up plan</li> </ul>	Government commitment to promote SHP development and utilization is sustained

## APPENDIX F – TRACKING TOOL



### Tracking Tool for Climate Change Mitigation Projects (For Mid-term Evaluation)

#### Special Notes: reporting on lifetime emissions avoided

**Lifetime direct GHG emissions avoided:** Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made **until the mid-term evaluation**, totaled over the respective lifetime of the investments. Please refer to the Manual for Calculating GHG Benefits of GEF Projects.

[Manual for Energy Efficiency and Renewable Energy Projects](#)

[Manual for Transportation Projects](#)

For LULUCF projects, the definition of "lifetime direct" applies. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO<sub>2</sub>eq per hectare per year), use IPCC defaults or country specific factors.

General Data	Results at Mid-term Evaluation	Notes
Project Title	Technology Transfer and Market Development for Small Hydro Power in Tajikistan	
GEF ID	4160	
Agency Project ID	4324	
Country	Tajikistan	
Region	ECA	
GEF Agency	UNDP	
Date of Council/CEO Approval	30-Jun-10	Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	2,000,000	
Date of submission of the tracking tool	15-Mar-15	Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1	Yes = 1, No = 0
Is the project linked to carbon finance?	0	Yes = 1, No = 0

Cumulative cofinancing realized (US\$)	6,450,000	
Cumulative additional resources mobilized (US\$)	1,000,000	additional resources means beyond the cofinancing committed at CEO endorsement

Objective 1: Transfer of Innovative Technologies		
<b>Please specify the type of enabling environment created for technology transfer through this project</b>		
National innovation and technology transfer policy	1	Yes = 1, No = 0
Innovation and technology centre and network	1	Yes = 1, No = 0
Applied R&D support	1	Yes = 1, No = 0
South-South technology cooperation	1	Yes = 1, No = 0
North-South technology cooperation	1	Yes = 1, No = 0
Intellectual property rights (IPR)	0	Yes = 1, No = 0
Information dissemination	1	Yes = 1, No = 0
Institutional and technical capacity building	1	Yes = 1, No = 0
Other (please specify)		
Number of innovative technologies demonstrated or deployed	2	
<b>Please specify three key technologies for demonstration or deployment</b>		
Area of technology 1	Renewable_Energy	
Type of technology 1	SHP	specify type of technology
Area of technology 2	Energy_Efficiency	
Type of technology 2	EE in the buildings	specify type of technology
Area of technology 3		
Type of technology 3		specify type of technology
Status of technology demonstration/deployment	4	0: no suitable technologies are in place 1: technologies have been identified and assessed 2: technologies have been demonstrated on a pilot basis 3: technologies have been deployed 4: technologies have been diffused widely with investments 5: technologies have reached market potential

Lifetime direct GHG emissions avoided		tonnes CO2eq (see Special Notes above)
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Objective 2: Energy Efficiency		
<b>Please specify if the project targets any of the following areas</b>		
Lighting		Yes = 1, No = 0
Appliances (white goods)		Yes = 1, No = 0
Equipment		Yes = 1, No = 0
Cook stoves		Yes = 1, No = 0
Existing building		Yes = 1, No = 0
New building		Yes = 1, No = 0
Industrial processes		Yes = 1, No = 0
Synergy with phase-out of ozone depleting substances		Yes = 1, No = 0
Other (please specify)		
Policy and regulatory framework		0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)		0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand



Capacity building		<p>0: not an objective/component                  1: no capacity built                  2: information disseminated/awareness raised                  3: training delivered                  4: institutional/human capacity strengthened                  5: institutional/human capacity utilized and sustained</p>
Lifetime energy saved		<p>MJ (Million Joule, IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a>)                  Fuel savings should be converted to energy savings by using the net calorific value of the specific fuel. End-use electricity savings should be converted to energy savings by using the conversion factor for the specific supply and distribution system. These energy savings are then totaled over the respective lifetime of the investments.</p>
Lifetime direct GHG emissions avoided		tonnes CO2eq (see Special Notes above)

Objective 3: Renewable Energy		
Please specify if the project includes any of the following areas		
Heat/thermal energy production	0	Yes = 1, No = 0
On-grid electricity production	1	Yes = 1, No = 0
Off-grid electricity production	1	Yes = 1, No = 0
Policy and regulatory framework	5	<p>0: not an objective/component                  1: no policy/regulation/strategy in place                  2: policy/regulation/strategy discussed and proposed                  3: policy/regulation/strategy proposed but not adopted                  4: policy/regulation/strategy adopted but not enforced                  5: policy/regulation/strategy enforced</p>

Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	5	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	5	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
<b>Installed capacity per technology directly resulting from the project</b>		
Wind		MW
Biomass		MW el (for electricity production)
Biomass		MW th (for thermal energy production)
Geothermal		MW el (for electricity production)
Geothermal		MW th (for thermal energy production)
Hydro	0.67	MW
Photovoltaic (solar lighting included)		MW
Solar thermal heat (heating, water, cooling, process)		MW th (for thermal energy production, 1m <sup>2</sup> = 0.7kW)
Solar thermal power		MW el (for electricity production)
Marine power (wave, tidal, marine current, osmotic, ocean thermal)		MW
<b>Lifetime energy production per technology directly resulting from the project (IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a>)</b>		
Wind		MWh
Biomass		MWh el (for electricity production)
Biomass		MWh th (for thermal energy production)
Geothermal		MWh el (for electricity production)
Geothermal		MWh th (for thermal energy production)
Hydro		MWh

	115,106.40	
Photovoltaic (solar lighting included)		MWh
Solar thermal heat (heating, water, cooling, process)		MWh th (for thermal energy production)
Solar thermal power		MWh el (for electricity production)
Marine energy (wave, tidal, marine current, osmotic, ocean thermal)		MWh
Lifetime direct GHG emissions avoided	14,400	tonnes CO2eq (see Special Notes above)

Objective 4: Transport and Urban Systems		
<b>Please specify if the project targets any of the following areas</b>		
Bus rapid transit		Yes = 1, No = 0
Other mass transit (e.g., light rail, heavy rail, water or other mass transit; excluding regular bus or minibus)		Yes = 1, No = 0
Logistics management		Yes = 1, No = 0
Transport efficiency (e.g., vehicle, fuel, network efficiency)		Yes = 1, No = 0
Non-motorized transport (NMT)		Yes = 1, No = 0
Travel demand management		Yes = 1, No = 0
Comprehensive transport initiatives (Involving the coordination of multiple strategies from different transportation sub-sectors)		Yes = 1, No = 0
Sustainable urban initiatives		Yes = 1, No = 0
Policy and regulatory framework		0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced

Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)		0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building		0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Length of public rapid transit (PRT)		km
Length of non-motorized transport (NMT)		km
Number of lower GHG emission vehicles		
Number of people benefiting from the improved transport and urban systems		
Lifetime direct GHG emissions avoided		tonnes CO <sub>2</sub> eq (see Special Notes above)

<b>Objective 5: LULUCF</b>		
<b>Area of activity directly resulting from the project</b>		
Conservation and enhancement of carbon in forests, including agroforestry		ha
Conservation and enhancement of carbon in nonforest lands, including peat land		ha
Avoided deforestation and forest degradation		ha
Afforestation/reforestation		ha

Good management practices developed and adopted		0: not an objective/component 1: no action 2: developing prescriptions for sustainable management 3: development of national standards for certification 4: some of area in project certified 5: over 80% of area in project certified
Carbon stock monitoring system established		0: not an objective/component 1: no action 2: mapping of forests and other land areas 3: compilation and analysis of carbon stock information 4: implementation of science based inventory/monitoring system 5: monitoring information database publicly available
Lifetime direct GHG emission avoided		tonnes CO <sub>2</sub> eq
Lifetime direct carbon sequestration		tonnes CO <sub>2</sub> eq

Objective 6: Enabling Activities		
<b>Please specify the number of Enabling Activities for the project (for a multiple country project, please put the number of countries/assessments)</b>		
National Communication		
Technology Needs Assessment		
Nationally Appropriate Mitigation Actions		
Other		
Does the project include Measurement, Reporting and Verification (MRV) activities?		Yes = 1, No = 0

## APPENDIX G – UNDP-GEF MIDTERM REVIEW EVALUATIVE MATRIX TEMPLATE

Evaluative Questions	Indicators	Sources	Methodology
<b>Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?</b>			
(include evaluative question(s))	(i.e. relationships established, level of coherence between project design and implementation approach, specific activities conducted, quality of risk mitigation strategies, etc.)	(i.e. project documents, national policies or strategies, websites, project staff, project partners, data collected throughout the MTR mission, etc.)	(i.e. document analysis, data analysis, interviews with project staff, interviews with stakeholders, etc.)
What lessons were learned from the sHPP constructed under the earlier UNDP project and the link to an IRD approach?	<ul style="list-style-type: none"> <li>- number of months of sustained operations of sHPP</li> <li>- number of local economic activities supported after sHPP operations</li> <li>- satisfaction of local people</li> </ul>	<ul style="list-style-type: none"> <li>-project documents</li> <li>-local jamoat personnel and sHPP personnel</li> <li>-data and information collection during mission</li> </ul>	<ul style="list-style-type: none"> <li>-document analysis</li> <li>-interviews with local personnel</li> </ul>
What are the other alternatives for Tajikistan for energy security?	<ul style="list-style-type: none"> <li>-number of other energy projects in Tajikistan</li> <li>- strategic plans for development of energy sector</li> </ul>	<ul style="list-style-type: none"> <li>- Ministry of Energy personnel</li> <li>- Government reports on energy sector</li> </ul>	<ul style="list-style-type: none"> <li>-document analysis</li> <li>-interviews with national level government personnel</li> </ul>
<b>Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far?</b>			
What proportion of the project budget has been spent and what is the official terminal date of the Project?	<ul style="list-style-type: none"> <li>-Project expenditures by year and component</li> <li>-Co-financing from GoT and other stakeholders (i.e. donors and NGOs)</li> </ul>	<ul style="list-style-type: none"> <li>-ATLAS outputs and CDRs</li> <li>-Project reports on co-financing</li> </ul>	<ul style="list-style-type: none"> <li>-data analysis of ATLAS outputs and CDRs</li> <li>-interviews with Project personnel</li> </ul>
What is the specific progress of strengthening the regulatory framework for SHP development?	<ul style="list-style-type: none"> <li>-adoption of the RES Law</li> <li>-time to clear sHPP applications</li> <li>-satisfaction of stakeholders on new system</li> </ul>	<ul style="list-style-type: none"> <li>-Project reports</li> <li>-Project staff</li> <li>-Government beneficiaries at the national level</li> </ul>	<ul style="list-style-type: none"> <li>-document analysis</li> <li>-interviews with project personnel and national level government personnel</li> </ul>
What is the progress of capacity building of government personnel to apply the new RES Law?	<ul style="list-style-type: none"> <li>-number of government personnel participating on formulation of new RES Law</li> </ul>	<ul style="list-style-type: none"> <li>-Project reports</li> <li>-Project staff</li> <li>-Government beneficiaries at the national level</li> </ul>	<ul style="list-style-type: none"> <li>-document analysis</li> <li>-interviews with project personnel and national level government personnel</li> </ul>

<b>Evaluative Questions</b>	<b>Indicators</b>	<b>Sources</b>	<b>Methodology</b>
What is the specific progress with building local capacity for manufacture of sHPP-related equipment?	-number of local technicians participating in manufacturing workshops and study tours - quantity of sHPP-related equipment produced at these workshops	-Project reports -Project staff -Workshop beneficiaries at the national level	-document analysis -interviews with project personnel and workshop-level personnel
What is the specific progress of IRD and the creation of economic benefits that would create sustained demand and cost recovery for sHPP operations?	- number of months of sustained operations of sHPP - number of local economic activities supported after sHPP operations - satisfaction of local people	-Project reports -Project staff -Beneficiaries at the community level	-document analysis -interviews with project personnel and national level government personnel
What is the specific progress of pilot sHPP developments?	- number of months of sustained operations of sHPP - number of local economic activities supported after sHPP operations - satisfaction of local people	-Project reports -Project staff -Beneficiaries at the community level	-document analysis -interviews with project personnel and national level government personnel
What is the progress of capitalization of the National Trust Fund that will facilitate scale-up of SHP development in Tajikistan?	- number of issues to resolve to make the Fund operational - number of sources willing to capitalize fund - satisfaction of government personnel	-Project reports -Project staff -National government level personnel	-document analysis -interviews with project personnel and national level government personnel
<b>Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?</b>			
What is the specific management structure of the Project?	- compliance to UNDP and GEF management practices	-Project reports -Project staff -National government level personnel	-document analysis -interviews with project personnel and national level government personnel
What have been the challenges and issues to implementing the Project and what are the mechanisms to address these challenges and issues	- number of issues identified during Project implementation - number of project progress reports issued during implementation	-Project reports -Project staff -National government level personnel	-document analysis -interviews with project personnel and national level government personnel

<b>Evaluative Questions</b>	<b>Indicators</b>	<b>Sources</b>	<b>Methodology</b>
	- number of changes made from original design of		
How does the Project monitor and evaluate progress in remote communities that are difficult to visit?	- number of sHPPs being developed and their location - number of visits made to remote communities - satisfaction of local government personnel and local stakeholders	-Project reports -Project staff -Local government level personnel	-document analysis -field trips with project personnel and interviews with local government personnel
How are the Project reports (i.e. QPMMs and PIRs) distributed for feedback and adaptive management?	- number of persons Project reports are distributed to - number of reports issued and the time intervals they were issued	-QPMMs and PIRs -Project staff	-Report and information analysis -interviews with project personnel
<b>Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?</b>			
Are there sufficient finances for all project components after the EOP?	- funds committed to capacity building of institutions, local workshops and continued sHPP operations in IRD communities - funds committed to NTF	-Project staff -Local and national level government personnel	-Report and information analysis -interviews with project and government personnel
Is there any open opposition to development of SHP and IRD in rural communities in Tajikistan?	- number of communities that do not want sHPP developments	-Project staff	-interviews with Project personnel
What is the current state of absorptive capacity of the national government agencies and local jamoats, notably for sHPP O&M?	- number of persons participating in institutional strengthening for RES Law application - number of local community persons involved with O&M of operational sHPPs in Tajikistan	-QPMMs and PIRs -Project staff	-Report and information analysis -interviews with Project personnel



## APPENDIX H – UNDP-GEF MTR REPORT AUDIT TRAIL

To the comments received on February 17, 2015 from the Midterm Review of (Technology Transfer and Market Development for Small-Hydropower in Tajikistan) (UNDP Project ID-4324):

Author	#	Para No./ comment location	Comment/Feedback on the draft MTR report	MTR team response and actions taken
UNDP-GEF	1	Abbreviation Section, pg iv	Add PPM?	PPM acronym added to abbreviations
	2	Table A, pg ix	This is not using the correct rating scale- the standard scale and the scale in the ToR is a 4 point scale from Likely to Unlikely; did you mean Moderately Unlikely (MU)?	Correct rating of Moderately Unlikely (MU) has been inserted
	3	Pg xii	This acronym needs to be explained the first time it is introduced here	PPM acronym added to abbreviations on pg iv
	4	Pg 1	It's not recommended to use acronyms for project titles unless this is an acronym used by the project team, the UNDP-GEF RTAs, and the CO; this is also confusing since it's the acronym used for the GEF Tracking Tools (TT)	Project acronym changed to Project throughout MTR report
	5	Pg 1	Not exactly; UNDP-GEF M&E policy says all Full-size projects are required to conduct MTRs.	Text has been changed to reflect author's comment
	6	Pg 1	Where is this information coming from? This is not in the ToR or the MTR Guidance	Text has been removed as it is not relevant to the MTR
	7	Pg 1	More description on methodology is necessary; please also describe the principles of design and execution of the MTR, the MTR approach and data collection methods, and limitations to the MTR	Section has been re-written to provide more detail on methodology
	8	Pg 2	Why was the TE Guidance used? This was not referenced in the ToR. The MTR Guidance should have been used (criteria for each are slightly different)	MTE guidance from 2014 was used. Section has been re-written to reflect this.
	9	Pg 3	This link is broken	This has been removed from the text.
	10	Pg 6	List the project outcomes as they are in the ProDoc and ToR, as I've inserted below	Correction has been made
	11	Pg 9	Refer to as Outcome, not Component, for consistency	Correction has been made
	12	Pg 9	This is not consistent with the Annexes	Correction has been made
	13	Pg 11	Suggested to expand the analysis to address items such as: <ul style="list-style-type: none"> <li>Are the project's objectives and outcomes or components clear, practical, and feasible within its time frame?</li> <li>Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality</li> </ul>	Additional text has been added to Section 3.1.2 to reflect the quality of the indicators and targets, and if changes are required

Author	#	Para No./ comment location	Comment/Feedback on the draft MTR report	MTR team response and actions taken
			and women's empowerment, improved governance etc...) that should be included in the project results framework at the indicator output level and monitored on an annual basis.	
	14, 15	Pg 11	How does this rating match the rating summary table in the executive annex on pg. viii? Is it the Progress Towards Results rating at the Objective level? Goal level? Please clarify here for consistency	Text has been changed to maintain consistency with the table on pg viii
	16	Pg 12	What about Outcome 4?	Text on progress of Outcome 4 has been added
	17	Pg 12	Also include here the ratings you give in the executive summary for the Progress Towards Results at the Goal level, the Objective level, and for each outcome either here or after your analysis in the Progress Towards Results Matrix below	This has been done (see Comment #14 and 15)
	18	Pg 13	Where is this footnote 11?	It has been deleted.
	19	Pg 13	Based on this analysis for progress on the Objective, is a Moderately Satisfactory (4) rating, as given in the Executive Summary ratings summary table, justified?	Yes, this rating is consistent with the Executive Summary. No changes made in the text.
	20	Pg 16	Based on this analysis for Outcome 2, is a Satisfactory (5) rating, as given in the Executive Summary ratings summary table, justified?	Yes, this is consistent and justified. No changes made in the text.
	21, 22	Pg 21, 22	Please fill in Achievement Description for these indicators	Achievement descriptor has been provided
	23	Pg 22	Please move the key to the top of the table as well/in place of at the bottom for increased readability of the Matrix	This has been provided on pg 13
	24	Pg 23	Should this text be moved up to before the Matrix analysis above for coherence?	Text has been moved to pg 12 before the matrix
	25	Pg 23	As per the ToR, please also discuss: <ul style="list-style-type: none"> <li>Were the project roles properly assigned during the project design?</li> <li>Are the project roles in line with UNDP and GEF programming guidelines?</li> </ul>	Additional discussion is provided in Section 3.3.1
	26	Pg 26	In addition to a summary of work planning, please also: <ul style="list-style-type: none"> <li>Assess the use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.</li> <li>Analyse if work-planning processes are results-based. If not, suggest ways to re-orientate work planning to focus on results.</li> <li>Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.</li> </ul>	Text has been added to Section 3.3.2 as requested.
	27	Pg 26	Analyze if the project has the appropriate financial controls, including reporting and planning, that allow	Text has been added to Section 3.3.3 as

Author	#	Para No./ comment location	Comment/Feedback on the draft MTR report	MTR team response and actions taken
			management to make informed decisions regarding the budget and allow for timely flow of funds.	requested.
	28	Pg 27	As per the ToR, this section should also examine whether or not the timeframe for various M&E activities and standards for outputs are specified.	Text has been added to Section 3.3.4 as requested.
	29	Pg 28	Is this the total target by the end of the project, or at the Mid-term? Please clarify	Clarified in Table 4 as the EOP target
	30	Pg 29-30	Please identify opportunities for stronger partnerships.	Text has been added to Section 3.3.5 as requested
	31	Pg 30	Assess: b. how adaptive management changes have been reported by the project management. c. how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.	Text has been added to Section 3.3.6 as requested
	32	Pg 30	What about PIRs?	Text has been added to Section 3.3.6 as requested
	33	Pg 31	Review if there are key stakeholders left out of communication, if the communication with stakeholders contributes to their awareness of project outcomes and activities and investment in the sustainability of project results, and if external project communications are in place and effective	Text has been added to Section 3.3.7 as requested
	34	Pg 31	The overall rating for Implementation and Adaptive Management given in the Executive Summary (5 – Satisfactory) should be stated here at the end of the section.	Text has been added at the end of Section 3.3.7 as requested
	35	Pg 31	This is not using the correct rating scale- the standard scale and the scale in the ToR is a 4 point scale from Likely to Unlikely; did you mean Moderately Unlikely (MU)	Corrections have been made in section to reflect the correct descriptor of the sustainability scale
	36	Pg 31	This sentence doesn't make logical sense	Sentence has been deleted and section has been re-written
	37-42	Pg 32	All ratings given should be included in the rating summary table in the executive summary and section 4.4 Ratings (even if they go beyond what is required in the MTR Guidance). Also, once again, please use the correct rating scale for sustainability	Entire sustainability section has been re-written with a sustainability matrix added for additional clarity

## APPENDIX I – MTR REPORT CLEARANCE FORM

### APPENDIX I – MTR REPORT CLEARANCE FORM

Midterm Review Report Reviewed and Cleared By:

Commissioning Unit

Name: Ms. Nargizakhon USMANOVA

Signature: 

Date: 24 April

UNDP-GEF Regional Technical Advisor

Name: Marina Olshanskaya, UNDP-GEF Regional Tehnical Advisor

Signature: \_\_\_\_\_ Date: 24 April 2015

## APPENDIX J - UNEG CODE OF CONDUCT FOR EVALUATORS/MIDTERM REVIEW CONSULTANTS<sup>52</sup>

### Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

### MTR Consultant Agreement Form<sup>53</sup>

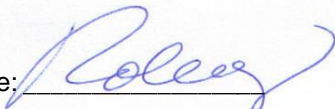
#### Agreement to abide by the Code of Conduct for Evaluation in the UN System

**Name of Consultant:**   Roland Wong  

**Name of Consultancy Organization** (where relevant): \_\_\_\_\_

**I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.**

Signed at Surrey, BC, Canada on March 26, 2015

Signature: 

<sup>52</sup> [www.undp.org/uneqcodeofconduct](http://www.undp.org/uneqcodeofconduct)

<sup>53</sup> [www.unevaluation.org/uneqcodeofconduct](http://www.unevaluation.org/uneqcodeofconduct)