

**DOCUMENT OF THE EUROPEAN BANK
FOR RECONSTRUCTION AND DEVELOPMENT**

<i>Name of Project</i>	TAJIKISTAN: SMALL BUSINESS CLIMATE RESILIENCE FINANCING FACILITY	
<i>PPCR amount requested</i>	Concessional finance (competitive reserve) <i>To be provided for local currency lending</i>	USD 5,000,000
<i>Indicative co-financing</i>	EBRD loan EBRD technical cooperation (TC) grant Total co-financing¹	Up to USD 10,000,000 USD 2,770,000 Up to USD 12,770,000
<i>Country targeted</i>	Tajikistan	
<i>Sector targeted</i>	Financial Institutions/Private Sector Development	
<i>Summary of proposal</i>	<p>The request is for a private sector pilot project that will launch an innovative financing facility to support the uptake of climate-resilient, water-efficient and energy-efficient technologies by small businesses, farmers and households. This pilot project will build on EBRD's extensive experience of providing special purpose intermediated finance through targeted credit lines channelled through partner financial intermediaries (PFIs) and supported by specialised technical assistance facilities. Recognising that energy security and water security are two of the main ways in which the private sector in Tajikistan is vulnerable to climate change, the project will aim to make climate-resilient, energy-efficient and water-efficient technologies accessible and affordable to small businesses, farmers and households. Specific technologies supported will include, <i>inter alia</i>, drip irrigation, water recycling and reuse in manufacturing, small-scale off-grid renewable energy generation, and energy efficiency improvements in residential dwellings. In supporting the climate resilience of the energy sector by reducing energy demand through efficiency improvements, this project will complement the EBRD/PPCR project <i>Tajikistan: Enhancing the Climate Resilience of the Energy Sector</i>, which aims to improve the climate resilience of the energy supply.</p>	
PROJECT FIT WITH PPCR OBJECTIVES AND THE TAJIKISTAN SPCR		
<p>Tajikistan's Strategic Programme for Climate Resilience (SPCR) identifies threats to energy and water resources as amongst the most critical climate change vulnerabilities facing Tajikistan. Specifically, the section on the private sector (page 15 of the SPCR) identifies the unreliable energy supply as a major constraint on private sector development. Climate change poses huge risks to energy security in Tajikistan due to the almost total dependency on hydropower (98% of electricity generation). This is exacerbated by the extreme vulnerability of Tajikistan's aging hydropower facilities to climate change impacts such as shifts in precipitation and snowmelt patterns, glacial melting and extreme weather events such as floods. In response to these threats, a major focus of the PPCR in Tajikistan has been on improving the climate</p>		

¹ Subject to EBRD Board approval

resilience of the energy supply, leading to the development of the EBRD/PPCR project *Tajikistan: Enhancing the Climate Resilience of the Energy Sector*. However, since the SPCR was developed it has become evident that the demand side also needs to be addressed in order to deal with the implications of climate change for Tajikistan's energy security. For example, at the PPCR Energy Sector Stakeholder Workshop in March 2012 it was determined that one of the most cost-effective ways of making Tajikistan's fragile energy system more resilient to climate shocks is by reducing demand through energy efficiency improvements. This was strongly supported by the World Bank's *Tajikistan Winter Energy Crisis* study (2012), which advocated energy efficiency savings in order to reduce the vulnerability of the energy system to seasonal and climate-driven shocks. Therefore, a clear need for support for energy efficiency improvements as part of the overall climate resilience response has emerged as a result of progress with SPCR implementation. At the same time, the SPCR also identified threats to water resources as another crucial dimension of Tajikistan's climate vulnerability. As stated on page six of the SPCR, climate change is projected to increase the likelihood of adverse conditions such as low rainfall, drought and flooding which will negatively affect agriculture, livelihoods, ecosystems and infrastructure. In particular, the SPCR outlines how Tajikistan's farmland, which is largely located in arid or semi-arid areas, is projected to experience increasingly low and erratic rainfall together with an overall reduction in water availability due to higher temperatures and evapotranspiration, and reduced snow accumulation in mountain areas. The SPCR identifies improved irrigation and the optimisation of water use in food production more broadly, priorities that are also included in Tajikistan's *Water Sector Development Strategy*. Despite the fact that irrigated farmland represents around 17% of total agricultural land, and generates around 80% of agricultural production, advanced, water-efficient irrigation systems such as drip and sprinkler irrigation are hardly used in Tajikistan. Farmers instead generally rely on inefficient flood irrigation, which represents a major climate change vulnerability in the light of projected climate change impacts on water resources. Agri-processing², which constitutes most of Tajikistan's light manufacturing, also relies heavily on access to process water and a reliable energy supply, both of which are threatened by climate change. Agri-processing is of critical importance to Tajikistan's agricultural sector as it creates markets for primary produce, has significant export potential and can help Tajikistan's agriculture to move up the value chain and provide higher value products, many of which are readily exported. The creation of the PPCR competitive set-aside therefore creates a new opportunity to build on the analysis and objectives of Tajikistan's SPCR to launch an innovative and scalable facility that will specifically target Tajikistan's private sector and provide finance and technical support to farmers, small businesses and households to enable them to adopt new water-efficient and energy-efficient technologies that will help to make their operations more resilient to the projected impacts of climate change on energy and water resources.

KEY INDICATORS, OUTCOMES AND RISKS

Key Indicators

In line with the overall PPCR Results Framework and the corresponding project-level Results Framework set out in Section 6, the key indicators of this Project will be:

Climate resilience

- Finance for climate-resilient water & energy efficient technologies extended to up to 2,000 small businesses, farmers and households
- Up to ten new climate-resilient, water and energy use technologies being used by farmers, small and medium enterprises (SMEs) and households

² For example cotton ginning, processing of fruit and nuts for export, etc.

Institutional development

- Tajik banking sectors delivers financial services and products that support national climate resilience objectives (e.g. SPCR)
- Progress on water and energy tariff reforms (with appropriate social safety nets) that achieve cost recovery and incentivise rational water and energy use
- PPCR concessional finance to leverage additional finance for water & energy use improvements by the private sector
- New and innovative financing mechanism for climate resilience technologies tested and implemented

Climate resilience benefits

The Project will have the following specific climate resilience benefits:

- Increased capacity of farmers, small businesses and households (both men and women) to cope with the projected impacts of climate change on water resources through the introduction and/or increased uptake of a range of water-efficient technologies in the agricultural, SME/manufacturing and residential sectors. These technologies will include, inter alia, drip irrigation, sprinkler irrigation, water recycling and reuse, water-efficient fixtures and fittings in buildings, improved water metering, etc.
- Increased capacity of farmers, small businesses and households (both men and women) to cope with the projected impacts of climate change on energy resources through the introduction and/or increased uptake of a range of energy efficient technologies in the agricultural, SME/manufacturing and residential sectors. These technologies will include, inter alia, energy-efficient irrigation pumps, energy-efficient equipment upgrades in manufacturing, small-scale off grid renewables such as solar energy, intermediate technologies such as solar water heaters, insulation, improved heating systems and metering in residential building, etc.
- Increased capacity of the Tajik banking sector to understand, promote and finance the adoption of improved water and energy technologies that improve the climate resilience of key sectors of the Tajik economy.
- Increased capacity of Tajik civil society (especially business associations, farmers' associations and housing associations) to understand climate resilience issues and water & energy efficiency issues and support businesses, farmers and households to access improved water and energy use technologies.

Cost Effectiveness

This project will enable the PPCR to leverage a significant amount of co-financing (potentially more than double the requested PPCR finance). The requested USD 5,000,000 concessional finance from the PPCR

will be matched by up to USD 10,000,000 loan finance and USD 2,770,000 grant finance (technical cooperation) from EBRD³. Furthermore, the possible extension of the facility could be considered at a later stage, subject to successful disbursement of the dedicated finance.

Demonstration Potential at Scale

This project will develop a replicable and scalable approach to increasing the uptake of climate resilience technologies that could subsequently be scaled up and/or replicated in other countries where climate change threatens water and energy resources. As EBRD's experience in other countries has shown, special purpose financing facilities in which finance is extended to enterprises and households supported by dedicated technical assistance has been extremely effective in delivering large volumes of finance for addressing issues such as energy efficiency and agricultural improvements. This project offers the opportunity to adapt this approach specifically to promote climate resilience through water and energy use optimisation, which could potentially also be deployed in many other countries beyond Tajikistan in due course. As water scarcity problems may be even more dramatic Tajikistan's downstream neighbours (e.g. Uzbekistan and Kazakhstan), there is enormous value in setting an example and prototyping an approach that could be replicated across the region.

Development Impact

This project will have a powerful development impact by directly supporting the livelihoods of farmers, and by supporting small businesses to reduce costs and optimise efficiency thereby increasing productivity, with important backward linkages to agricultural production (agri-processing dominates manufacturing in Tajikistan). Supporting enterprises in this way will also have a positive impact on the creation of employment by the SME sector, as well as expanding markets for agricultural produce and enabling Tajik agriculture to move up the value chain and take advantage of export opportunities. Furthermore, supporting the uptake of improved water and energy use technologies by households will bring further development benefits by enabling households to reduce energy and water costs (thus freeing up household income for other purposes) and address the very real human health and welfare concerns caused by the erratic energy supply, especially during winter when heating demand currently outstrips the energy supply, in large part due to wasteful energy use.

Environmental/Social Risks

This project has been appraised by EBRD's Environmental and Sustainability Department, in line with EBRD's Environmental and Social Policy. This appraisal has concluded that the project does not entail any significant environmental or social risks. Nevertheless, the project will still be implemented in line with the requirements of EBRD's Environmental and Social Policy, including its Performance Requirement 9 on financial intermediaries, which sets out the environmental and social standards that must be ensured in projects involving financial intermediaries. The PFIs will be supported in meeting the requirements of Performance Requirement 9 as part of EBRD's due diligence during project development. Also, during the Implementation Support Facility stage, appropriate environmental, social and gender considerations will be

³ Subject to EBRD final internal and Board approvals

included in the sub-project design, implementation and monitoring.

Gender Impact

This project will fully integrate gender issues into its design and implementation. It has been developed with the active input of EBRD's Gender Team. Strong gender analysis and consideration will be built into both the Project Preparation Facility and the Implementation Support Facility. Specifically, the Project Preparation Facility will ensure that the market analysis of the energy and water use/needs of businesses and household includes a strong gender perspective, in order to ensure that water and energy differentiated access, use and control by men and women at the household and farm level is fully understood and then used to inform project design and implementation. Men and women are differentially affected by climate change impacts on water resources. Women are intrinsically linked to water resources because of their roles and responsibilities in using and managing water both at the household and farm level. Since women and girls often cook, clean, farm, and provide health care and hygiene for their households, they are often directly affected by scarcity and/or poor water quality and contamination. This project will take into consideration the differentiated roles of women and men in agriculture (e.g. irrigation, etc.) as well as in SMEs. This will be coordinated with Activity I of the accompanying project *Tajikistan: Improving the Climate Resilience of the Energy Sector*, which will entail extensive business and household surveys of energy security and climate vulnerability. Gender considerations will also be firmly integrated into the Implementation Support Facility. In particular, special care will be taken to ensure that both men and women can equally benefit from access to credit, and to extension, training and support services. This may entail a need for special training for loan officers, for example, or for the engagement of female loan officers and extension workers to ensure that female farmers and entrepreneurs enjoy equal access to the facility. This is especially important given relatively high proportion of female farmers and single headed households in Tajikistan, due the large number of men from rural areas who have departed as migrant workers in other former Soviet Union countries. EBRD's recent experience of setting up dedicated credit lines for female entrepreneurs in Turkey will be of great value to this aspect of the project. The additional costs of addressing gender issues in this project will be covered by the additional grant resources being made available by EBRD from its multi-donor Early Transition Countries Fund (or from another of EBRD's bilateral donor trust funds).

DETAILED PROJECT DESCRIPTION

1. Project overview

This will be a pilot initiative that is intended to break new ground in the important, emerging area of financing pro-business climate resilience measures in country that is highly vulnerable to the impacts of climate change. This approach will be open to extension and possible expansion subject to successful results. Building on the EBRD’s well-tested model of special purpose credit lines channelled through financial intermediaries (FIs), the project will set up a facility that will provide sub-loans for the purpose of climate resilience financing via credit lines set up through participating financial intermediaries (PFIs). The facility will have a specific focus on sectors where micro- and small businesses are vulnerable to climate variability and change through their sub-optimal use of water and energy, and through unreliable and intermittent power supply. This will imply a main focus on agricultural (rural), SME (agri-processing and manufacturing) and residential sectors. This project will build on experience gained through the EBRD’s Tajik Agricultural Financing Facility (TAFF) – see section 5.2.

Typical sub-borrowers (or clients) will include:

- Farmers: investments in drip irrigation, which brings substantial water savings and improved productivity (as opposed to currently used flood irrigation), or investments in efficient water pumps.
- Small and medium enterprises (SMEs): energy efficiency measures and improved water use technologies such as the introduction of water recycling systems, replacement of water intensive technologies with more modern alternatives (dry processing as opposed to wet processing).
- Households: loans for energy and water efficiency improvements, installation of water efficient infrastructure, fixtures and appliances in homes, and investments in alternative energy supplies (e.g. solar panels, solar water heaters, etc.).

	Water use	Energy use
Agriculture	<ul style="list-style-type: none">• Water-efficient irrigation	<ul style="list-style-type: none">• Energy use in irrigation (energy savings, energy reliability)
SMEs	<ul style="list-style-type: none">• Water efficiency in industrial processes	<ul style="list-style-type: none">• Energy efficiency in industrial processes• Energy supply reliability improvements
Residential	<ul style="list-style-type: none">• Water savings in residential buildings	<ul style="list-style-type: none">• Energy savings in residential buildings• Energy supply reliability improvements

The results of this pilot Framework may lead to a package of projects that, in aggregate, will i) improve climate resilience at the sub-borrower level and in the country as a whole, ii) have a direct positive effect on climate resilience with related environmental benefits, iii) improve the commercial prospects of sub-borrowers, iv) demonstrate the benefits of climate resilience to other financiers and sub-borrowers, v) prepare a platform for future engagement in policy dialogue with the Tajik authorities on climate resilience and energy efficiency issues.

The detailed project context is set out in the accompanying annexes. Annex I contains a description of climate change projections and vulnerabilities in Tajikistan. Annex II describes water and energy use in the three target sectors (agriculture, SMEs and residential).

2. Project objectives

2.1. Transition impact

The Transition Impact of this project will focus on three main objectives: demonstration effect, transfer of skills, and market transformation for resource efficiency. This will be supported by targeted policy dialogue in support of these objectives.

<i>1. Demonstration Effect</i>	
Demonstration effect	<ul style="list-style-type: none"> • A powerful demonstration impact can be achieved within Tajikistan and across other climate-vulnerable countries in terms of showing how improved climate-resilient technologies can be financed and made accessible to a wide range of market players in climate vulnerable sectors (agriculture, agribusiness/manufacturing & residential). • A strong impact can also be achieved through the introduction and uptake of improved climate-resilient technologies that are currently either not present or poorly dispersed in Tajikistan. • Demonstration can also be achieved through introduction of innovative financing mechanisms for climate resilient technologies (e.g. sub-loans to businesses for water efficiency savings) that could be replicated in other facilities and countries. • Best practice case studies will be disseminated through PFI branches.
<i>2. Transfer of skills</i>	
Transfer of skills	<ul style="list-style-type: none"> • The project will facilitate building and transfer of expertise in climate resilience and related financing among PFIs and SMEs. • Introduction of new, climate-resilient technologies to the market and to businesses, and building the capacities of enterprises to use them productively and sustainably. • The project will also transfer new skills to PFIs, specifically allowing them to identify investment opportunities and structure loans for in improved climate-resilient technologies and practices.
<i>3. Market transformation for climate resilience</i>	
Market transformation for resource efficiency	<p>The project will also help to transform the way in which market players use and value essential, climate-dependent resources (i.e. water and energy). This will be achieved by introducing new technologies onto the market which have not previously been accessible to market players, and new financing modalities which PFIs have previously not offered.</p> <p>The project will also help to deliver real economic benefits in terms of resource efficiency and productivity gains, as well as future benefits through improving the climate change resilience of businesses, and improving the sustainability of resources including through more rational pricing e.g. shadow water pricing.</p>

Table 1: Project transition impact

2.2. Additionality

Additionality will be achieved by combining the necessary medium term financing with technical expertise to promote investments in climate resilience, which are currently limited in the country. Related targeted policy dialogue will also make an important contribution to additionality, namely the project will support policy dialogue in energy and water tariff reforms (with appropriate social safety nets) after the introduction of the financing mechanism to invest in efficient energy and water use. The EBRD's additionality is also in a

commercial approach to the project, which, despite high reliance on concessional financing at the initial stage, will promote market principles. The project will also endeavour to cover a wide range of end-borrowers from various regions of the country.

2.2. Risk assessment and mitigating actions

Risk	Mitigating actions
Underutilisation of the Facility due to low demand or poor cooperation of PFIs.	The risk is mitigated by the EBRD’s experience in similar facilities in other countries. Appropriate design of the project through the Phase I TC, grant funded TC and incentives to borrowers and the flexibility of blending climate resilience financing with conventional credit lines will encourage the PFIs to join at the initial stage. After uptake of the Facility and gradual systemic changes, climate resilience financing is expected to be demanded on a stand-alone basis.
Sustainability of climate resilience financing after completion of the project.	The risk is partly mitigated by the expected rises in electricity and water use tariffs to sustainable levels in the near future, which will add to the demand for climate resilience. Policy dialogue promoting regulatory reforms to help develop the market for climate resilient technologies will add to sustainability.
Underperformance of PFIs and sub-borrowers.	This risk is mitigated by careful selection of creditworthy PFIs that show willingness to develop new product and that have a suitable client base and capacity. Strong lending standards at the selected PFIs will also minimise the risk of underperformance by sub-borrowers. Additionally, PFIs will be assisted by consultants, who will be involved in marketing, analysis and implementation of sub-loans, further reducing the risk

Table 2: Summary of risks and mitigating actions

3. Project management and implementation

3.1. Project structure

The facility will be provided in the form of climate resilience credit lines through PFIs. PPCR concessional finance will be blended with EBRD loan finance in order to make the credit lines affordable to sub-borrowers.

3.2. Participating financial institutions

The Framework will be available for PFIs in Tajikistan, which include banks and non-bank microfinance institutions (NBMFIs). The EBRD has relationships with eight FIs in Tajikistan, which would be interested in the new facility. NBMFIs are expected to be the key PFIs for the facility due to their relative flexibility, good presence in rural areas and strong social orientation compared to banks. Banks are likely to be interested in climate resilience financing structures for their SME clients and farmers.

3.3. Technical Cooperation (TC) activities

A Technical Cooperation (TC) package will be developed and launched following concept review. It is anticipated that this will take the form of a TC package that will be structured in two phases.

- Phase I (pre-signing): Project Preparation Facility
- Phase II (post signing): Implementation Support Facility

3.3.1. Project Preparation Facility

The Project Preparation Facility will require grant resources of up to USD 470,000 (to be provided by EBRD's Early Transition Countries Fund) and will have a duration of six months. Where possible the TC work will build upon and make full use of analysis conducted by the UN Food & Agriculture Organisation (FAO) on investment needs on the agricultural (especially irrigation) and agri-processing sectors. It will also build on the experience gained through the EBRD's Tajik Agricultural Finance Framework (TAFF) and other relevant projects and programmes run by other agencies, as listed in section 5.4. Specifically, the Project Preparation Facility will entail the following activities:

- Detailed review of past and on-going international support for irrigation improvements to ensure that lessons and experience from these activities are fed in to project development.
- Detailed market analysis of the various categories of businesses and households that have a viable demand for investment in water and energy use improvements This will include a strong gender perspective, in order to ensure that water and energy differentiated access, use and control by men and women at the household and farm level is fully understood and then used to inform project design and implementation.
- Analysis of industrial and residential appliances for which there may be a demand for improved water and energy use improvements.
- Development of a climate resilience audit methodology that will allow the specific climate resilience needs of specific enterprises to be appraised rapidly to determine specific investment and technology needs;
- The identification of potentially appropriate, climate-resilient, water and energy use technologies and practices, together with an assessment of their level of market penetration, and the identification of barriers to their uptake and availability;
- Assessment of potential market size and level of demand for sub-loans for climate resilience technologies;
- Development of recommendations on the eligibility criteria for sub-loans for water and energy use improvements; Development of an initial pipeline of potential sub-loans both for businesses and residential;
- Identification of training and other implementation support needs;
- Support for PFIs in meeting requirements of meeting Performance Requirement 9 (on financial intermediaries) of EBRD's Environmental and Social Policy in order to ensure that PFIs are able to apply EBRD's environmental and social standards to each sub-loan.
- The identification of priority areas for policy dialogue with national authorities in order to address barriers to the uptake of, and build the market for, climate-resilient water and energy use technologies.
- Assessment of general awareness of the public of the need for climate resilience water and energy technologies and preparation of a plan to engage on these issues, with a

differentiated approach outlined taking into consideration gender, age and rural/urban divide etc.

3.3.2. Implementation Support Facility

Subject to the success of Phase I and PFI signing, Phase II will take the form of an Implementation Support Facility. This will require grant resources of up to USD 2.2 million (to be provided by EBRD's Early Transition Countries Fund) and will have a duration of up to three years. The possibility of FAO playing an implementation role in the agricultural/irrigation component will be fully explored following Concept Review. Specifically, the Implementation Support Facility will undertake the following activities:

- On-going pipeline development and management;
- Establishing, maintaining and updating a database of appropriate climate-resilient technologies and practices (subject to findings of the Project Preparation Facility);
- Performing climate resilience audits (water & energy use) of potential sub-borrowers in order to determine technology and financing needs;
 - The technical capacity to perform climate resilience auditing services, and to identify packages of climate resilience measures to be implemented by sub-borrowers, is a critical component of the Programme. Potential sub-borrowers will receive support in reviewing existing operations, identifying the best measures to pursue and structuring investment proposals to obtain financing.
- Marketing support to PFIs to promote the benefits of the facility
- On-going support for the integration of appropriate environmental, social and gender considerations in the sub-project design, implementation and monitoring, in line with EBRD's Environmental and Social Policy and its Performance Requirement 9 on financial intermediaries
- Implementing a public outreach programme to increase awareness of the issues, with differentiated approaches used according to the target audience with factors such as gender, age and urban/rural being taken into consideration. In particular, special care will be taken to ensure that both men and women can equally benefit from access to credit, and to extension, training and support services. This may entail a need for special training for loan officers, for example, or for the engagement of female loan officers and extension workers to ensure that female farmers and entrepreneurs enjoy equal access to the facility.
- Training and capacity building activities:
 - Training for sub-borrowers in use of climate resilience technologies (e.g. drip irrigation, water recycling, etc.) in both commercial and residential sectors.
 - Training for loan officers in structuring and approving sub-loans for climate resilience technologies for both commercial and residential use (including different styles of communication needed etc.).

3.3.3. Capacity building of civil society

A further TC activity will be deployed to increase the demonstration effect and transfer of skills through working with civil society, especially business associations. Engagement with citizens (especially through building capacity of SME associations, in terms of their understanding of climate resilience issues as well as how to access loans) is crucial to increase the utilisation of the facility itself. At the same time a powerful demonstration impact can be expected within Tajikistan and across other climate-vulnerable countries in

terms of showing how improved climate-resilient technologies can be financed and made accessible to a wider range of market players in climate vulnerable sectors, including residential, agricultural and SMEs.

Specifically, this TC activity will focus on improving business associations’ technical knowledge of climate resilience and associated water and energy efficiency, and on improving business associations’ understanding of the facility itself. This will involve the following:

- Identifying relevant business associations and their needs and bridge existing technical knowledge gaps related to climate resilience and associated water and energy efficiency;
- Providing capacity building training workshops to identified business associations in selected towns/cities/regions of Tajikistan. These training sessions will include technical knowledge on climate resilience and associated energy efficiency as well as information on the financing facility.

This activity will be managed by EBRD’s Civil Society Unit and will focus on micro and small business associations, but also potentially farmers’ associations, residents’ associations, housing associations, etc. The funding needs will be USD 100,000, which will be provided by EBRD’s Early Transition Countries Fund.

4. Financing structure

4.1. Breakdown of uses of project finance (indicative)

Use of finance	Indicative budget (USD)	Anticipated funding source
Technical Cooperation (TC) activities		
Project Preparation Facility (a)	470,000	EBRD’s Early Transition Countries fund
Implementation Support Facility (b)	2,200,000	
Civil society capacity building (c)	100,000	
TC sub-total (a) + (b) + (c)	2,770,000	
Financing		
Financing to be extended through PFIs (d)	Up to 15,000,000	EBRD loan finance blended with PPCR concessional finance ⁴
Credit lines sub-total (d)	Up to 15,000,000	
GRAND TOTAL (a) + (b) + (c) + (d)	Up to 17,770,000	
<i>MDB fee (project management and implementation services)</i>	350,000	

Table 3: Breakdown of proposed uses of finance

⁴ The ratio of PPCR finance to EBRD loan finance will be defined during the Project Preparation Facility. The amount of EBRD financing will depend on this ratio, but in any way limited to a maximum of USD 10,000,000 for this pilot project.

4.2. Breakdown of sources of project finance (indicative)

Anticipated funding source	Purpose	Amount (USD)
EBRD ETC Fund (grant)	TC activities: <ul style="list-style-type: none"> • Project Preparation Facility • Implementation Support Facility • Civil society capacity building 	2,770,000
EBRD (loans)	Loan financing	Up to 10,000,000
PPCR concessional finance (from competitive reserve)	Blended with EBRD Loan financing	5,000,000
TOTAL		Up to 17,770,000

Table 4: Breakdown of proposed sources of finance

4.3. Justification for local currency lending (LCL)

As detailed in the SPCR, the underdeveloped financial system is one of the main barriers to private sector development in Tajikistan, and the specific needs of climate-vulnerable groups such as farmers and agribusiness SMEs means that local currency lending (LCL) in Tajik Somoni will be essential in order to facilitate their access to improved water and energy use technologies and to achieve the outcomes desired by the PPCR. In order to help move the Tajik economy onto a climate-resilient growth path, it is essential to remove the foreign exchange (FX) risk otherwise these much needed investments will not happen, as the FX risk would outweigh the benefits of the project.

Although the Tajik economy is heavily dollarized, and businesses and households alike use USD as a mean of saving and payment, small every day operations are carried out in Tajik Somoni. Revenues of small businesses and farmers are primarily in Tajik Somoni, which limits their ability to borrow in foreign currency without being exposed to high FX risk. Due to lack of FX hedging options and shortage of Tajik Somoni in the banking system, financial institutions tend to pass the FX risk to their borrowers. Therefore financing in local currency will ensure the FX risks are not passed to small businesses and farmers. It is impossible that climate-resilient technologies such as drip irrigation or small-scale energy efficiency improvements could be made accessible to SMEs through dollar loans without exposing them to significant FX risks, and it is also not possible to impose the exchange rate risk on the financial intermediaries, unlike e.g. in some middle-income countries.

The TJS/USD exchange rate has varied considerably over the past decade, as shown in the below diagram although it has stabilised recently. In July 2003 the somoni was worth approximately 0.38 dollars, but by July 2013 this had dropped to approximately 0.21 dollars and remained stable at that level since then. There is no hedging market for Tajik somoni at the moment and it is unlikely that one will emerge in time for the operation. The exchange

rate risk of the PPCR portion would therefore have to be borne by the SCF Trust Fund, while the risk for the EBRD portion would be borne by the EBRD.



Figure 1: the Tajik Somoni/US dollar exchange rate (2003 – 2103)

In order to be viable and achieve the planned outcomes, this project would need to benefit from concessional finance in TJS, committed either by the new procedure to be developed as part of the FRM, or if this would delay the programme too much, according to the interim procedure for local currency lending under SCF operations (document dated 15 January 2013), as follows:

- d) Following the procedures for the relevant MDB, upon receipt of transferred funds from the Trustee, the MDBs or the country borrower converts the USD amounts disbursed from the SCF Trust Fund into local currency;
- e) Repayments from the borrower to the MDB will follow the procedures of the relevant MDB and are governed by the agreements between the borrower and the MDB;
- f) The MDB will return all proceeds received by borrowers to the SCF Trust Fund in USDs and in accordance with the FPA; and
- g) Losses or gains incurred due to the use of local currency lending will be taken into account for the final balance of the SCF Trust Fund. When the SCF Trust Fund is liquidated, the balance of funds remaining in the Fund will be returned to Contributors based on the type and amount of contribution as provided in the Standard Provisions Applicable to the Strategic Climate Fund, attached to the Contribution Agreements between the Trustee and the SCF contributors.

5. Coordination with other programmes

The project will complement other PPCR activities and the efforts of other IFIs in assisting the country in gradually moving towards more efficient water and energy use. It will also complement the EBRD's own projects in water management with municipalities of Tajikistan and in the power sector.

5.1. Coordination with other PPCR activities

Tajikistan – Enhancing the Climate Resilience of the Energy Sector (EBRD): this project, which has not yet been approved by the PPCR Subcommittee, will focus on building the climate resilience of Tajikistan's hydropower-dominated energy sector in Tajikistan through an integrated programme of activities designed to i) improve the enabling environment for climate-resilient energy security, ii) strengthen institutional capacities for climate-resilient hydropower operations, and iii) implement the climate-resilient upgrade of a major HPP facility as a ground-breaking demonstration project. This project, which addresses climate resilience on the energy supply side, will be highly complementary to the proposed project, which focuses on the energy demand side. The two projects will be implemented in close coordination, especially with respect to the outreach activities (e.g. household and business surveys, civil society engagement etc.).

Building Capacity for Climate Resilience Project (ADB): this project aims to strengthen climate risk management practices and awareness of climate change amongst a variety of stakeholders including government, civil society, the media and highly vulnerable groups such as women and the poor; and to institutionalize the existing PPCR Secretariat to ensure effective implementation of climate change projects beyond the duration of the PPCR. Cooperation with this project will be especially important to ensure outreach to wider stakeholders.

Tajikistan – Building Climate Resilience in the Pyanj River Basin (ADB): The project aims to increase resilience to climate vulnerability and change of communities in the Pyanj River Basin. The project's impact will be improved livelihoods of Pyanj River Basin communities vulnerable to climate variability and change. The project's outcome will be reduced adverse effects of climate variability and climate change in 59 villages in 19 jamoats in the Pyanj River Basin. The project has four outputs: Output 1 is flood protection infrastructure climate-proofed in 10 jamoats. It will (i) upgrade and climate-proof flood and mudflow protection infrastructure in 10 locations, including riverbank reinforcement, embankment reconstruction, restoration of stream beds, terracing and planting of trees, and soil stabilization; (ii) establish O&M practices, develop O&M guidelines, and train local units of the responsible agencies; (iii) develop early warning communication systems through the use of modern technologies; (iv) establish disaster risk management committees; and (v) conduct training and disseminate information on the impact of climate change and adaptation measures for local government officials and local institutions such as khashar (mutual self-help groups), mahala (neighbourhood associations), and women's committees. There will be important opportunities for lesson learning between the two projects, especially with regard to supporting irrigation improvements in local communities.

Tajikistan – Environmental Land Management and Rural Livelihoods Project (World Bank): The objective this is to enable rural people to increase their productive assets in ways that improve natural resource management and resilience to climate change in selected climate vulnerable sites. The project has 3 components. (1) Rural production and land

resource management investments component will provide financing in the form of small grants for subcomponents: 1.1. Sustainable village-based rural production and land resource management, and grants for the management plans under sub-component 1.2. Larger-scale initiatives in sustainable community land management. (2) Knowledge management and institutional support component will provide facilitation services and technical and institutional support for rural populations to plan, implement and manage rural investments. Relevant data collection and analysis, and information exchange for wider adoption of sustainable land management will also be supported. (3) Project management and coordination component will finance the operating costs of an Implementation Group (IG) within the Committee for Environmental Protection (CEP) to carry out project management function. There will be important opportunities for lesson learning between the two projects, especially with regard to supporting irrigation improvements in local communities.

5.2. Coordination with other EBRD activities

Sugd Loss Reduction Project (EBRD): this project focuses on demand side management by financing the installation of modern electricity meters, meter reading systems and design and installation of an automated billing system in northern Sugd region of Tajikistan. The project will reduce existing level of electricity losses in the network, increase bill collection levels and improve quality of electricity supply. It will also entail policy dialogue with Barki Tojik (Tajikistan's main energy company) and national authorities around energy tariff reform (with appropriate social safety nets). EBRD will ensure close coordination especially around the implications of energy tariff reform for private sector operations and investment in energy efficiency measures.

Municipal water supply upgrade investments (EBRD): EBRD has invested heavily in upgrades of municipal water supply systems since 2005, in a large number of cities and towns all over Tajikistan. These investments, which have all been delivered under EBRD's Integrated Framework for investment in municipal water improvements, focus on the renovation of water supply infrastructure, improvements in the corporate and financial management of water companies, and reforms to water tariff regimes to move towards full cost recovery (with appropriate social safety nets). EBRD will ensure close coordination especially around the implications of water tariff reform for private sector operations and investment in water efficiency measures.

Tajik Agricultural Finance Facility – TAFF (EBRD): the TAFF project (now completed) supported the restructuring of Tajikistan's agricultural sector by providing revolving credit lines to Tajik financial intermediaries (banks and non-bank financial institutions) to on-lend funds to farmers for seasonal finance. The objective was to provide alternative finance to small farmers and support the freedom to farm concept whilst employing best farming practice particularly with respect to environmental and labour issues. This programme will provide valuable lessons that will help to establish the proposed new project. **5.3. Coordination with other IFI activities**

Central Asia Energy-Water Development Program – CAEWDP (World Bank): this is a four-year program, which aims to improve diagnostics and analytical tools to support the countries of the region in well-informed decision-making to manage their water and energy resources, strengthen regional institutions, and stimulate investments. The following specific project activities are taking place under the framework of the CAEWDP

Tajikistan’s Winter Energy Crisis study (World Bank): this work entails a four pronged strategy to reduce the winter energy shortages: i) demand side management including energy efficiency and fuel switching; ii) increase of supply through rehabilitation of existing hydropower assets, construction of thermal plants and renewables; iii) increase in energy trade; and iv) comprehensive policy review, including tariff adjustments, development of a social safety net, and strengthening of regulations. It should be noted that the Government increased tariffs during 2006 - 2011 by 250% and followed by another 12% to reach an average of 2.25 US cents/kWh in 2012 (although still very low by average standards). An appropriate tariff policy will require an accompanying program of demand side management measures at the customer level to reduce demand for electricity and moderate the impact of increasing tariffs on total household energy bills.

Ferghana Valley Water Resources Management Project (World Bank): this project aims to improve the capacity for increased irrigated agriculture productivity in the Ferghana Valley by improving land and water management, and to improve safety and regulation of the Kairakkum Dam and Reservoir, thereby contributing to enhanced water management security and efficiency at the basin level. It will also entail strengthening the early warning system of the Kairakkum dam as well as in carrying out a geotechnical study. This project will coordinate with the World Bank in order to take advantage of the clear opportunities for cooperation and complementarity.

Support for improving the enabling environment for business (IFC): IFC works with private sector clients, government, and civil society to bring the benefit of global expertise to Tajikistan through its advisory services and selected investment projects. IFC also assists the Tajik government in furthering the nation’s development, especially efforts to develop the private sector through support for financial markets, manufacturing, and services sectors. In addition, IFC has provided advisory services in the areas of improving the investment climate, improving the business environment for agribusiness, supporting the development of credit bureaux and supporting the development of microfinance.

5.4. Coordination with other agencies

EBRD is aware that a number of other bilateral and multilateral agencies have been working to support irrigation improvements in Tajikistan.

Growth in the Rural Economy and Agriculture Tajikistan Project – GREAT (Germany and UK): the GREAT programme implemented by GIZ (Germany) with co-financing from BMZ (Germany) and DFID (UK) includes has a key component on micro-finance products (including energy-efficiency loans) as well as agricultural extension services. The extension services approach builds on the TAFF project (see above). Whereas the GREAT project targets smaller entrepreneurs and farmers, the proposed new PPCR/EBRD project is likely to target slightly larger enterprises, which will create strong opportunities for complementarity. The market analysis to be carried out under the Project Preparation Facility will pay careful attention to the activities and experience of the GREAT project. Important lessons will also be learned from GIZ’s support for micro-loans for thermal insulation in Gorno-Badakhshan Autonomous Oblast.

Other agencies active in related fields include USAID and the Swiss government. EBRD’s contribution through this project will be new and additional, as so far limited work has been done to develop intermediated finance enabling small businesses and households to access improved water and energy technologies, including improved irrigation. This project will also

have a specific focus on the private sector and on-farm irrigation facilities (as opposed to publicly owned irrigation infrastructure). This project will build on the experience and lessons learned by other agencies so far, and the Project Preparation Facility will include a detailed review of past and on-going international support for irrigation improvements to ensure that these lessons are fed in.

6. Results framework

The below project-specific results framework will be used to monitor and evaluate the project, through collaboration between EBRD, the PPCR Secretariat, and the CIF Admin Unit. This framework forms part of Tajikistan’s overall PPCR M&E work plan.

Results	Indicators	Target	Baseline	Related project activities	Responsible entity(ies)
TRANSFORMATIONAL IMPACT					
A1. Increased resilience of households, communities, businesses, sectors and society to climate variability and climate change	A1.3 (core): Numbers of people supported by the PPCR to cope with effects of climate change	Finance for climate-resilient water & energy efficient technologies extended to up to 2,000 small businesses, farmers and households	Finance for climate-resilient water & energy efficient technologies is difficult for small businesses, farmers and households to access	Provision of dedicated loan financing for climate-resilient water & energy efficient technologies and extension and training services to support users	EBRD Implementation Support Facility
A2. Strengthened climate responsive development planning	A2.1 (core): Degree of integration of climate change in national, including sector planning - e.g., national communications to UNFCCC, national strategies, PRSPs, core sector strategies, annual development plans and budgets, and	Tajik banking sectors delivers financial services and products that support national climate resilience objectives (e.g. SPCR)	Tajik banking sector does not consider climate resilience objectives in its operations	Provision of dedicated loan financing for climate-resilient water & energy efficient technologies and extension and training services to support users	Implementation Support Facility PPCR Secretariat

	NAPs				
PROJECT OUTCOMES					
B1. Strengthened adaptive capacities	B1 (core): Extent to which vulnerable households, communities, businesses and public sector services use improved PPCR supported tools, instruments, strategies, activities to respond to Climate Variability and Climate Change.	Up to ten new climate-resilient, water and energy use technologies being used by farmers, SMEs and households	Farmers, SMEs and households that rely on water & energy resources do not usually use improved water & energy use technologies	Introduction of new water & energy use technologies to the Tajik market	Implementation Support Facility PPCR Secretariat
B2. Improved institutional framework in place	B2 (core): Evidence of strengthened government capacity and coordination mechanism to mainstream climate resilience	Progress on water & energy tariff reforms that achieve cost recovery and incentivise rational water & energy use (with appropriate social safety nets)	Water and energy tariffs are currently well below cost recovery levels and incentivise irrational and wasteful water & energy use, which exacerbates climate change vulnerabilities	Policy dialogue with water & energy companies and corresponding regulatory bodies and ministries	EBRD PPCR Secretariat
B4. Climate responsive investment approaches identified and implemented	B4 (optional): Leverage of PPCR funding against public and private investments in climate sensitive sectors	PPCR concessional finance to leverage additional finance for water & energy use improvements by the private sector	No additional finance leveraged thus far	Additional finance for private sector water & energy use improvements to be sought from EBRD	EBRD PPCR Secretariat

B5. Climate responsive investment approaches identified and implemented	B5 (core): Quality of and extent to which climate responsive instruments/ investment models are developed and tested	New and innovative financing mechanism for climate resilience technologies tested and implemented	No dedicated financing mechanisms for climate resilience technologies currently exist	Provision of dedicated loan financing for climate-resilient water & energy efficient technologies and extension and training services to support users	Implementation Support Facility PPCR Secretariat
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Table 5: Proposed results framework

ANNEX I

Climate change projections and vulnerabilities in Tajikistan

Tajikistan is regarded as the country most vulnerable to climate change in the EBRD region. Analysis by the World Bank (2008) ranked Tajikistan as the most climate-vulnerable country in the ECA region due to the highly climate-sensitive nature of its glacial hydrological systems, the extremely heavy dependence of the Tajik economy and livelihoods on water and energy resources that depend upon the glacial hydrology (especially hydropower and irrigation), as well as the low income levels and generally low levels of institutional capacity in central and local government. Climate projections indicate that Tajikistan will experience higher temperatures, reduced rainfall and higher evapotranspiration with an increased frequency of extreme events such as floods, droughts and storms. These changes are projected to impacts, such as fluctuations in the hydrological cycle - especially from glacial retreat and flash floods – with downstream consequences for ecosystems and water resources for livelihoods, water resources for hydro power, potable water, irrigation and food security. These impacts pose direct threats to agricultural production and rural livelihoods, for example from degradation of arable land, forests, pastures and rangeland. Climate change is projected to pose additional and significant risks to economic activity, human welfare and the environment in Tajikistan. Recent droughts and weather extremes have illustrated existing inadequacies in the climate resilience of major sectors, for example the inability of hydropower facilities to cope with the extreme winter of 2008. Understanding current vulnerability to extreme events provides a starting point for assessing the impact of increasing climatic variability and future climate change for Tajikistan. Not only may such existing and known risks increase, but new areas may also be put at risk.

It is expected that Tajikistan's farming lands, which are essentially in arid and semi-arid areas, will be exposed to increasingly low and erratic rainfalls coupled with adverse effects on water resources through increased regional temperatures, higher evapotranspiration and reduced snow accumulation in mountain glaciers. This increased variability will place greater strain on already stressed environments and increase desertification. Rain-fed agriculture is particularly vulnerable to climate change, but irrigated agriculture (over 80% of cultivated land in Tajikistan is irrigated) will suffer the compounded effects of climate change on dilapidated infrastructure and low capacity to collect adequate resources for operation and maintenance. Crop yields in some regions are projected to decrease by up to 30% by the end of this century, threatening local food security. A key focus of the Government of Tajikistan in the long run will need to be on addressing climate associated risks in water resources and agricultural production which are tightly linked in the production landscapes and economy of Tajikistan. For example, the Water Sector Development Strategy identifies irrigation as one of its main strategic objectives. The country's agriculture sector is heavily dependent on irrigation, which is extremely inefficient and wasteful due to predominantly basic technologies and outdated practices (such as flood irrigation). The business case for water-efficient irrigation is especially strong for producers of high-value crops such as fruit and nuts, and market gardening, where efficient water use can boost productivity and reduce input costs. Improving water use efficiency is also important for SMEs engaged in agriculture processing which use water extensively as part of the production process. Investments in more efficient water use will help such enterprises to save costs over time and improve

resilience to climatic variability and change, which may have significant impacts on localised seasonal water availability.

Energy security is another important facet of Tajikistan's vulnerability to climate change. Tajikistan is extremely dependent on electricity generated by hydropower, which in turn is highly climate sensitive. Tajikistan's hydropower sector, which provides 98% of total electricity, is highly vulnerable to climatic variability and change. Approximately 70% of inhabitants of Tajikistan suffer from extensive deficit of electricity during the winter season. For example, during the severe winter of 2008 many households, especially in rural areas on the peripheries of the grid, had no access to energy for heating and cooking. This situation particularly affects mainly women and girls due to their responsibilities at the household level. Urban households were also badly affected as they did not have alternative coping strategies (such as the use of firewood) that rural communities could fall back on. The recurrent winter electricity deficits caused by the inability of energy infrastructure to meet winter energy demands, means that these problems are persistent and worsening. The economy and population over years have gradually shifted to electricity as the main power supply (both for heating and business) as prices for other sources of energy (oil, coal, fuel, natural gas) increased and supply chains interrupted, mainly due to country's isolated location and difficult diplomatic relations with neighbouring Uzbekistan. As a result the economy has developed over dependence on electricity as the main power supply, while its hydropower generation potential remains unutilised due to lack of investments and is expected to diminish over time owing to negative impact of the climate change. As Tajikistan's electricity generation generates almost no GHG emissions, and yet is highly climate-sensitive, energy efficiency measures in Tajikistan contribute directly towards climate change adaptation, as opposed to mitigation.

SMEs in Tajikistan are also vulnerable to these climate change impacts. The economy is highly dependent on glacial hydrology, with all productive sectors of the economy (energy generation, agriculture, agri-processing and other manufacturing) directly influenced by water resources, which are in turn heavily influenced by climatic factors. SMEs in these sectors are affected by climate variability and change through their water and energy use, both of which are heavily influenced by climatic conditions. Water and energy are often used sub-optimally by SMEs due to inefficient technologies and practices, which exacerbates their vulnerability to climate change. The regulatory context often fails to set clear incentives for efficient water and energy use (e.g. unclear water pricing, low energy tariffs) which contributes towards inefficient use and longer-term climate vulnerability. In such conditions businesses and households begin to look for more reliable alternative sources of energy even if it entails relatively higher costs. Upon introduction of more expensive energy sources users gradually realise importance and benefits of energy efficient measures. Therefore there is an emerging potential for energy efficiency market. Perversely, Tajikistan is one of the least energy-efficient countries in the world⁵, a situation which exacerbates the severe strains on the country's energy infrastructure and further builds the case for investment in energy efficiency improvements. The proposed project will also complement on-going and planned PEU investments that aim to make Tajikistan's energy generation and transmission infrastructure more robust and resilient to climate change.

⁵ International Energy Agency Energy Balances data set; World Bank Development Indicators Database.

ANNEX II

Water and energy use in the target sectors (agriculture, SMEs and households)

Agriculture

Agriculture is hugely important for the Tajik economy. In 2010 it accounted for 22% of GDP and 33% of exports, as well as employing 67% of the economically active population. Agricultural produce accounted for three of Tajikistan's main exports: cotton (USD 144 million or 16% of total exports), fruits (USD 102 million or 11%) and vegetables (USD 49 million or 5%)⁶. Cotton is the overwhelmingly dominant cash crop and is of strategic importance to Tajikistan. It is a vital source of export earnings and tax revenue. Cotton prices have held up despite reductions in the prices of many other agricultural products. Between March 2009 and February 2010 the global cotton export price rose from USD 937 per tonne to USD 1931 per tonne, and increase of 107%. Cotton excluded, fruit and vegetables make up almost 95% of Tajikistan's remaining agricultural exports. Fruit represents almost 2/3 of agro-foods sold abroad. In order to realise its agricultural potential, Tajikistan must focus on higher value added production in order to grow exports. High-quality & high-value fruit and vegetable production has real potential for export growth to international markets. The potential for future growth of fruit exports is significant as areas planted with fruit have increased significantly in the recent past (by 13,600 hectares since 2010) especially in the Sugd province, where most fruit processing companies are located.

Agricultural water use

All of Tajikistan's main agricultural exports – cotton, fruits and vegetables – rely upon irrigation. While irrigated farmland represents only about 17% of all agricultural land, it generates about 80% of agricultural production. Access to water for irrigation is a serious constraint on agricultural production, and approximately 20-30% of irrigable lands are not used, due mainly to deterioration of irrigated systems. More efficient irrigation is needed in order to make agricultural production more resilient to climate change. Water-saving technologies such as drip irrigation and zero-tillage offer significant opportunities for increasing agricultural productivity and reducing input costs. While all cotton is irrigated in Tajikistan, it is estimated that 40% is irrigated sub-optimally. Cotton is typically flood-irrigated, half from channels, half from pumping from underground. Poor water management is a major threat to cotton production and a constraint on productivity improvements. The majority of Tajikistan's freshwater resources are allocated for cotton irrigation. Irrigation (primarily for cotton in the Khatlon and Sugd regions) consumes up to 80% of the country's total freshwater intake; however, approximately one-third of all irrigation water is lost before reaching the fields due to inefficient use, resulting in water shortages downstream. According to Tajikistan's national standards, a hectare of cotton should require 8,000 m³ of water per year; actual use is thought to range from 10,000 to 20,000 m³. In many parts of Tajikistan, irrigation infrastructure is in disrepair. While most irrigation infrastructure is in public hands, farmers also lack on-farm equipment such as pumps, gauges, meters and piping needed for better irrigation management.

⁶ Aluminium was the top export at \$543 million or 60% of total exports.

Modern and efficient irrigation technologies (specifically, drip irrigation) are essential for optimising the productivity of modern, large fruit orchards and for the development of this important, export-oriented agricultural sector. The EBRD-financed TAFF project calculated that one cubic metre of water generates USD 0.13 of gross income for wheat, USD 0.2 for cotton, USD 3.5 for traditional fruit and USD 7.64 for modern (drip irrigation) fruit production. Drip irrigation entails the construction of water storage facilities and a station with access to electricity or stand-alone generation (e.g. solar), pumping equipment, dispatching and plot dispatching lines. The typical installation cost is USD 5,320 per hectare (for a plot of 15 ha). Modern orchards require plots of 15 ha for effective use of investment in drip irrigation, meaning typically around USD 440K of initial investment per orchard. The introduction of improved irrigation technologies to large orchards is anticipated to have positive knock-on effects on the penetration of improved irrigation technologies in general, by increasing market penetration of drip irrigation technologies thus facilitating access by smaller farmers. Water use fees for irrigation are currently low, but will inevitably have to rise in order to cover the costs of essential irrigation infrastructure maintenance. Currently, farmers pay a fixed fee of USD 1.3/1000 m³ for water use regardless of the water supply system used (i.e. gravity fed or pumped), meaning gravity or lifted irrigation. Analysis by the ADB shows that water utilization fees for gravity-fed irrigation, which comprises two-thirds of irrigation systems, should be increased to USD 3.1/1000 m³ to ensure full cost recovery. For pumped systems, fees should be increased to USD 5.5/1000 m³, reflecting the additional energy costs (see below). Such increases will make crop production unprofitable unless significant water use savings are achieved. This will incentivise the production of higher-value crops and the introduction of more efficient irrigation systems, especially fruit and vegetable production.

Agricultural energy use

Agricultural irrigation in Tajikistan is heavily reliant on energy for pumping, which is the second biggest energy demand after the huge Talco aluminium plant. Tajikistan has around 740,000 ha of irrigated land of which about 280,000 ha rely on pumping systems. Pumping facilities in public irrigation are generally in disrepair and inefficient. In many parts of Tajikistan, irrigation water has to be pumped at heavy energy costs, especially in Sugd province (e.g. Zafarabad, where irrigation water has to be pumped up 100 metres). Unreliable energy supply constrains income-generating activities and has severe consequences for industrial production and access to water (including irrigation). The decline in the acreage of arable land since the collapse of the FSU has been largely a consequence of water and irrigation problems. Because of the higher prices for energy that followed the break-up of the FSU, many regions that were previously irrigated by pumps with intense use of electricity have now no access to water for irrigation. Therefore, using water more efficiently in irrigation also has the potential to deliver significant energy savings, as the volume of water that needs to be pumped can be significantly reduced. Energy tariffs in Tajikistan are currently low, but it is widely understood that this low level is not sustainable and that they need to increase by roughly 50% in the short term. According to a World Bank assessment, Barki Tojik needs to implement tariff increases (with appropriate social safety nets) in order to achieve operating cost recovery and financial viability of the sector. In January 2010, the government increased the tariff by 25% to bring the weighted average tariff to USD 2.0 cents /kWh. The prospect of rising energy tariffs has serious consequences for energy costs associated with the inefficient and expensive pumping of water for irrigation.

Small & medium-sized enterprises

The SME sector in Tajikistan relies heavily on processing agricultural produce, especially cotton and textiles, as well as food processing. There are approximately 50 cotton gins operating in Tajikistan, some dominated by large industry players, and some independent. There are also a large number of agri-processing SMEs that process produce such as fruit, nuts and vegetables. For example, Sugd province contains a large number of SMEs that process fruit & vegetable products such as fruit juice, jam/marmalade, canned products, dried fruit and nuts. Agri-processing SMEs offer the potential to help Tajik producers move up the value chain, by producing higher-value manufactured products with greater export potential, as well as providing employment and markets for primary agricultural production.

Water use by SMEs

Many agri-processing facilities involve water-intensive processes such as washing, canning and beverage production, and are therefore sensitive to water availability (e.g. seasonal variability) and to water use costs. SMEs that rely on municipal water supplies are subject to municipal water tariffs. While these have historically been low and poorly enforced, water tariff reform is proceeding in many municipalities. For example, EBRD is working with numerous municipalities and the state water company (KMK) to bring water tariffs up to full cost recovery levels (with appropriate social safety nets). For example, in the city of Kurgan-Tube the EBRD investment in the Southern Tajikistan Water Rehabilitation Project resulted in an increase in the business water tariff from USD 0.17 per m³ in 2009 to USD 0.63 per m³ by January 2013. Improved metering is also improving billing and tariff collection. Increasing water tariffs are therefore an important driver for water efficiency improvements by water-intensive SMEs. The prospect of increasing water use tariffs, together with the existing threat of seasonal water scarcity and the implications of climate change, create incentives for SMEs to optimise water efficiency in their operations through improved water use technologies such as water recycling, water re-use, condensate recovery, dry processing technologies and improved water metering.

Energy use by SMEs

SMEs in Tajikistan rely upon energy for their manufacturing operations, including the processing of cotton and other agricultural produce. The commercial sector is also highly dependent on electricity for heat and lighting, as well as industrial processes. However, the quality of supply is poor with frequent unplanned outages. About 70% of the population currently suffers from blackouts during the winter, imposing direct costs in terms of foregone revenue from economic activity, and additional costs due to damage to equipment and interruption of business processes. These shortages, estimated at about 2,700 GWh, about a quarter of winter electricity demand, impose economic losses estimated at over USD 200 million or 3% of GDP. The unreliable electricity supply has a negative impact on the development of business opportunities. For example, the World Bank's Business Economic Environment Survey of 2008 reported that 80% of firms cited power supply reliability as a major obstacle to doing business in Tajikistan. A reliable power supply is critical for Tajikistan's economy and development. Without reliable, affordable electricity throughout the year, Tajikistan's businesses cannot invest, operate and create jobs.

Industrial electricity tariffs are currently low in Tajikistan (USD 1 cents/kWh in January 2012). However it is widely understood that they will inevitably have to increase over the coming years in order to meet the costs of maintaining and upgrading the energy

infrastructure. According to a recent World Bank assessment, Barki Tojik needs to implement tariff increases in order to achieve operating cost recovery and financial viability of the sector. Improvements in electricity metering are also expected to improve billing and tariff collection rates. For example, EBRD and the World Bank are providing support to improve metering including the installation of over 100,000 retail meters. However, the prospect of increased electricity tariffs is not the only incentive for SMEs to invest in energy use technologies. The unreliable electricity supply also creates incentives for the use of off-grid energy generation and storage capacity, such as small-scale renewables (solar, wind, hydro) and energy storage equipment (e.g. UPSs etc.).

Residential

The residential sector in Tajikistan also offers significant opportunities for investments in water and energy efficiency improvements.

Residential water use

Although municipal tariffs for residential water users these have historically been low and poorly enforced, they are being increased in many municipalities in order to bring them up to full cost recovery levels, with appropriate accompanying social safety nets. For example, in the city of Kurgan-Tube the EBRD investment in the Southern Tajikistan Water Rehabilitation Project resulted in an increase in the residential water tariff from USD 0.07 per m³ in 2009 to USD 0.21 per m³ by January 2013. Improved metering is also improving billing and tariff collection. Increasing water tariffs are therefore an important driver for water efficiency improvements by residential users, such as the installation and use of water-efficient fixtures and appliances.

Residential energy use

Approximately 70% of the Tajik people suffer from extensive shortages of electricity during the winter. Distribution losses have increased in the last decade due to changes in consumption patterns, and due to the use of electricity for space heating (including residential) which overloads the network. System overall losses are high at around 20%. In winter, when residential electricity is available only intermittently, households warm their homes by burning solid fuels (wood and coal predominantly). As a result, the incidence of indoor air pollution including carbon monoxide poisoning is high in families, and women potentially are very exposed due to time spent indoors. Residential electricity tariffs have historically been low, but are expected to rise in order to finance essential investment in the maintenance and upgrading of energy infrastructure. Since January 2010, residential electricity tariffs have been set at USD 2.1 cents/kWh, whereas a recent World Bank assessment found that tariff increases are needed (with appropriate accompanying social safety nets) in order to achieve full operating cost recovery and financial viability of the sector. In addition, improvements in electricity metering are also expected to improve billing and tariff collection rates. For example, EBRD and the World Bank are providing support to improve metering including the installation of over 100,000 retail meters. The unreliable electricity supply (caused in part by network overloading) and the prospect of further tariff rises provide important incentives for investment in improved energy use technologies, including both energy efficiency and coping mechanisms for supply unreliability. The World Bank estimates that demand-side energy efficiency measures in the residential sector such as insulation of residential buildings/apartments, introduction of energy efficiency standards and

labelling and solar heating, could reduce winter demand by 103 GWh or 1% of winter energy demand by 2020 and would require around USD 72 million of investments. Space heating accounts for 70% of the annual electricity consumption of an average household. Based on regional experience, energy efficiency savings of 30-40% are attainable from improved building insulation. If 30% of urban residential households implements insulation of their apartments by 2022, winter demand could be reduced by 25 GWh¹⁸ or 0.2% by 2020. The GoT has already launched initiatives to replace old incandescent lamps with compact fluorescent lamps (CFLs) for all households across the country. The GoT has also introduced various energy savings technologies in construction, with accompanying regulatory legal acts. In addition to the introduction of compact fluorescent lighting, additional savings could be realised through the introduction of energy efficient household appliances such as refrigerators. The saving potential from introduction of energy efficient refrigerators alone is estimated at 65 GWh or 0.4% of winter energy demand by 2020. Solar water heaters and PV systems could also contribute towards energy efficiency improvements at the household level.