Project Information Document/ Identification/Concept Stage (PID)

Concept Stage | Date Prepared/Updated: 09-Aug-2018 | Report No: PIDC148273

BASIC INFORMATION

A. Basic Project Data

Project ID	Parent Project ID (if any)	Environmental Assessment Category	Project Name
P166751		B - Partial Assessment (B)	Energy Efficiency Improvements in Public Buildings in the Kyrgyz Republic
Region	**Country**	**Date PID Prepared**	**Estimated Date of Approval**
EUROPE AND CENTRAL ASIA	Kyrgyz Republic	09-Aug-2018	
Financing Instrument	**Borrower(s)**	**Implementing Agency**	**Initiation Note Review Decision**
Investment Project Financing	Kyrgyz Republic	Community Development and Investment Agency (ARIS)	The review did authorize the preparation to continue

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	2.66
Total Financing	2.66
Financing Gap	0.00

DETAILS

Non-World Bank Group Financing

Trust Funds	2.66
Energy Sector Management Assistance Program	2.66

B. Introduction and Context

Country Context

While seeking to reduce the social and economic vulnerability of its population, the Kyrgyz Republic remains one of the poorest countries in the Europe and Central Asia (ECA) region. The country has maintained economic growth since its independence in 1991, but its gross domestic product (GDP) has fallen, from US$7.5 billion in 2014 to US$6.6 billion in 2016, following deterioration in the external environment

(including falling exports and remittances, a decline in gold output, and other factors). Significant efforts by the Government since the independence have contributed to an overall downward trend in poverty, but according to World Bank estimates, the poverty rate (measured by national standards) remains high and above that of most countries in the ECA region: in 2015, 32.1 percent of the total population was in poverty, and this rate is projected to stagnate. Poverty is concentrated in rural areas, where utility services are also of inferior quality, with 7 out of 10 poor persons living there. At the same time, a large majority of the population is clustered near the poverty line, facing broken steps to upward mobility (incomes too low to allow for savings and investments) and a high risk of falling further into poverty (exposure to shocks and insufficient safety nets).

The economy of the Kyrgyz Republic is fragile, making it difficult for the country to support further poverty reduction efforts and to absorb shocks. The country follows an export-oriented growth strategy. Exports and public finance are supported by exploitation of natural resources, and more specifically by reliance on a single gold mine. Recent economic growth has been supported by urbanization, which has been driving one-time gains in productivity and income, but much of this growth is concentrated in the informal sector. Growth has also been supported by expansion of domestic consumption fueled by remittances, which accounted for 30 percent of GDP by 2013. While the services sector has been one of the key contributors to the country's growth, agriculture and industry have grown below the overall average. The importance of remittances declined after 2013, as the stock of migrants abroad stabilized and the share of households receiving remittances declined. At the same time, the country has difficulties accommodating an excessive labor supply because of low business and industrial growth. The economy is further challenged by weak governance and political instability. Socioeconomic disparities in urban and rural areas, exacerbated by ethnic and other divisions between the rural south and urban north, have also generated communal tensions, leading to at least two cases of violent conflict during the last 20 years. The state has significantly eroded its fiscal buffers, and the fiscal deficit of the budget is one of the highest in the ECA region. As a result, the Kyrgyz Republic has limited fiscal space to respond to shocks, and a significant shock could considerably harm the country's fragile economy and the well-being of its population.

Sectoral and Institutional Context

The Kyrgyz Republic ranks among the 15 most energy intensive countries worldwide. Its energy intensity (measured as energy use per US$1,000 GDP) has increased in 2010-2014 by around 13 percent from 181 kgoe/$1,000 GDP to 204 kgoe/$1,000 GDP. The country not only uses about 23 percent more energy per US$ GDP produced compared to other ECA countries, but also ranks among the 15 most energy intensive economies worldwide.

The Kyrgyz buildings stock is a major contributing factor to the high energy intensity. Buildings are the main electricity consumers in the country, accounting for more than 70 percent of electricity supplied to end-consumers in 2016. Specific energy demand in buildings (estimated average of 250 kWh per square meter) is also high compared to other ECA countries, even when adjusted for heating degree days. Reasons for the high energy intensity in the Kyrgyz buildings sector include the large share of dated buildings with poor

insulation, old heating and lighting systems, and years of under-maintenance. In addition, the widespread use of electricity for heating purposes explains the high share of buildings in terms of electricity consumption.

The public buildings sector accounts for approximately 10 percent of total electricity consumption with an upward pressure that is partially controlled by the enforcement of power consumption limits for public buildings. The public buildings stock is estimated to be composed of 9,780 buildings with educational and health sector buildings accounting for more than half of the total number of buildings. The majority of the public buildings stock was constructed 35-75 years ago during the Soviet period without any energy efficiency (EE) considerations. A recent assessment revealed that 90 percent of the public building stock is in need of rehabilitation. Accentuated by insufficient resources for maintenance, public buildings are characterized by high heat losses due to the dilapidated condition of the building envelope and the heating system, and are poorly maintained. In addition, an urban heating assessment completed in 2015 confirmed that, on average, around 20-30 percent of the heat demand in public buildings in urban areas remains unmet every year due to the high heat loss of buildings combined with insufficient and unreliable heat and electricity supply. As a result, many public buildings are severely under-heated with negative impacts on public service delivery, comfort levels and well-being of students, toddlers, patients and staff. In addition, while the territory of the Kyrgyz Republic is subject to high seismic hazards, according to a recent study, about 80 percent of schools and kindergartens in the country have low seismic safety ratings and are likely not compliant with the local seismic safety regulation.

The energy savings potential and related co-benefits in the public buildings sector are significant. Based on available energy audits for public buildings in the Kyrgyz Republic, it is estimated that EE improvements would help to reduce energy demand by 40-80 percent, which can make an important contribution to curbing the country's winter power shortages. Combining EE with renewable energy (RE) measures would further help to decrease electricity consumption and associated greenhouse gas (GHG) emissions in public buildings, while reducing recurrent public energy expenditures that could be used for better operation and maintenance of the buildings. For instance, domestic solar energy resources provide good potential to further increase the energy performance of buildings in combination with EE measures given the dry climatic conditions in the Kyrgyz Republic with 2,600 hours of sunshine per year and annual Global Horizontal Irradiation (GHI) of approximately 1,500 kWh per square meter. In addition, an important co-benefit of EE improvements is the increase in comfort levels in buildings – in winter, indoor temperatures in schools, kindergartens and hospital are as low as 13°C. Combining EE/RE investments in buildings with seismic improvements help to provide a healthier and safer learning, working and recovery environment in schools, hospitals and other public buildings, while reducing energy consumption.

The Government starts recognizing the importance of EE improvements and has initiated a number of important steps to help improve the EE framework. In the recent years, some progress has been made on improving the enabling environment for EE, including: (i) adoption of a Medium-Term Tariff Policy for 2014-2017, which increased the weighted average electricity and heat tariffs for non-residential customers, including the public sector, by more than 50 percent for electricity (to KGS 2.23/kWh or USD 0.03/kWh) and more than 80 percent for heating (to KGS 1,695/Gcal or USD 24.7/kWh); (ii) development and partial

enactment of action plans to help reduce the electric load from public buildings, including options such as installation of solar panels, solar water heating, consumption limits and fuel switching of heating systems; (iii) adoption of EE-related legislation and regulation, including for instance adoption of an EE performance law for new buildings (2012), enactment of regulation on rules of energy certification of buildings (2012) as well as a regulation pertaining to the periodic control of EE of boilers, heating and hot water supply systems in building; (iv) implementation of grant and loan financed projects targeting EE in buildings, including the Heat Supply Improvement Project (HSIP) approved on October 27, 2017, to which this Recipient-Executed grant is linked (see below).

Despite the recent progress, multiple barriers continue hampering EE improvements. While the potential for EE improvements in public buildings is significant, a number of technical, economic, institutional, legal, regulatory and financial impediments are preventing comprehensive EE investments from being undertaken: (i) low energy tariffs and norm-based billing for district heating; (ii) strained public sector budgets and lack of access to commercial financing by public entities, including for energy efficient retrofits; (iii) public budgeting regulations that limit achievable and retainable energy cost savings; (iv) lack of local market capacity and experience (e.g. energy auditors, design institutes, construction companies, etc.) in preparing and implementing high quality EE projects; (v) lack of credible data, awareness and behavioral inertia, which hamper the demand for and investments in EE products and services; and (vi) institutional and regulatory barriers, such as incomplete legislation and weak enforcement of building codes.

The proposed Recipient-Executed Trust Fund (RETF) is directly linked to the HSIP and is supported through ongoing Bank-executed technical assistance. The proposed RETF is part of a hybrid Trust Fund (involving a Bank-executed and a Recipient-executed part) in the amount of US$4 million supported by the State Secretariat for Economic Affairs (SECO) on behalf of the Government of Switzerland. The RETF is linked to the HSIP, which was approved on October 27, 2018, and aims to improve the efficiency and quality of heating in three project areas: the district heating system in Bishkek, individual household-level heating stoves in select pilot rayons, and EE improvements in public buildings. Specifically, the proposed RETF would provide co-financing to the EE component (Component 3) of the HSIP to enhance the achieved energy savings impact in the same buildings retrofitted under the HSIP and further strengthen market capacity and awareness. The proposed RETF is supported by a number of ongoing technical assistance activities financed by the Energy Sector Management Program (ESMAP), the Global Facility for Disaster Reduction and Recovery (GFDRR) and the Bank-executed part of the hybrid Trust Fund supported by SECO. Specifically, complementary activities supported through the Bank-executed technical assistance program on EE involve: (i) assessment of the public buildings stock in terms of EE potential and seismic typologies; (ii) market assessments for EE and RE technologies for public buildings; (iii) energy audits and seismic baseline studies in selected buildings; (iv) development of a Roadmap on scaling-up EE in the medium-to long-term; (v) targeted technical assistance and training to local companies and stakeholders on EE; (vi) EE diagnostics and investment plans in 3-4 select cities/municipalities where buildings will be retrofitted under HSIP/RETF; and (vii) development of operational documents to facilitate implementation of EE investments.

In addition, the RETF builds on the Bank's broader engagement in the energy sector. Specifically, the RETF builds on and complements the following World Bank-supported activities in the Kyrgyz Republic, including:

(i) results and key recommendation of the urban heating assessment completed in 2015, which identified EE improvements as one of the most cost-effective ways in adequately meeting heating demand in public buildings; (ii) a comprehensive technical assistance program in the energy sector, which helps to inform energy sector policy reforms, including the development of medium-term tariff policies and associated annual electricity tariff increases for different consumer groups inter alia supported through past and potentially future Development Policy Operations (DPOs); and (iii) the Urban Development Project and the Enhancing Resilience in Kyrgyzstan Project, which support the integration of EE as part of seismic resilience and urban infrastructure improvements in public buildings.

Climate Change. The Project will contribute to climate change mitigation and adaptation by improving EE and seismic resilience of selected buildings. The scale-up of climate-pro action under the HSIP and the proposed RETF in the Kyrgyz Republic is closely aligned with the World Bank Group's and ECA's Climate Action Plan 2017-2020.

Relationship to CPF

The proposed project is aligned with the draft Country Partnership Framework (CPF) for 2018-2022, which highlights harnessing energy potential (part of Focus Area 2 on supporting transformative investments to enhance growth potential) as well as climate change (part of Focus Area 3 on reducing vulnerability and enhancing resilience) as two of its priority areas. EE improvements in public buildings is one of the proposed results indicators for climate change mitigation under the CPF.

C. Project Development Objective(s)

Proposed Development Objective(s)

The proposed activity aims to pilot innovative energy efficiency and renewable energy technologies in selected public buildings in the Kyrgyz Republic.

Key Results

The proposed key results indicators include the following:(i) megawatt installed capacity from renewable energy; and (ii) number of innovative technologies piloted.

D. Preliminary Description

Activities/Components

The proposed project will be financed through a US$2.66 million recipient-executed grant provided by the Government of Switzerland and channeled through ESMAP, a multi-donor Trust Fund (TF). The RETF is

directly linked to the HSIP by providing co-financing towards Component 3, which aims to demonstrate the benefits of EE improvements in public buildings. Due to a timing lag between the HSIP and the proposed RETF, the latter was not submitted as joint co-financing (but its scope was described as part of the HSIP).

The proposed RETF involves three Components: (1) piloting of innovative EE and renewable energy (RE) technologies in selected public buildings; (2) capacity building and technical assistance support; and (3) grant implementation support.

COMPONENT 1: Piloting of innovative EE and RE technologies (estimated US$1,522,000 RETF financing). This component will provide investment grants to pilot innovative EE and RE technologies in a number of buildings that will be retrofitted as part of Component 3 of the HSIP.

Eligible technologies. Innovative technologies piloted under Component 1 are aimed at complementing standard EE and seismic measures supported under the HSIP, demonstrate viable alternatives to traditional electric heating in public buildings and enhance the combined electricity savings impact. Eligibility criteria for innovative technologies are proposed to include the following: (i) internationally proven and well-tested technologies for buildings; (ii) additional energy savings impact compared to the standard technical EE solution supported under the HSIP and/or enhanced reliability of energy supply; (iii) replication potential as assessed through the RE potential; and (iv) sufficient market capacity to supply, install and operate the technologies. On the basis of these criteria and the draft findings of a market assessment on innovative EE/RE technologies, including walk-through energy audits in 10 public buildings, eligible technologies are expected to include (non-exhaustive list): solar photovoltaic (PV) rooftop (with or without power storage battery); sanitary hot water air source heat pump; large air-to-water heat pump for space heating (through ventilation system or central heating network); and LED lighting with controls (movement, daylight, time). Stand-alone RE units (e.g. small hydro, wind, PV) are not eligible under the RETF.

Selection of buildings for innovation grants. The innovative technologies would be piloted in a subset of public buildings selected under the HSIP and implemented alongside comprehensive EE and seismic measures supported under the HSIP. The innovation grants will be provided in three annual rounds (in line with the buildings selection and implementation process under HSIP). Prioritization criteria for the selection of buildings where innovation grants will be provided will be based on the results of the detailed energy audits and be made based on the following criteria: (i) technical feasibility, applicability and viability for the building context; (ii) impact on electricity savings; (iii) mitigating impact on power cuts (buildings experiencing frequent power cuts would be prioritized); and (iv) increase in deployment of innovative technologies under the HSIP.

Implementation readiness. The first set of buildings to be retrofitted under the HSIP (involving four schools, two kindergartens and two health sector buildings) has been selected and preliminary walk-through energy and seismic audits were conducted for all buildings to confirm eligibility of the buildings as per HSIP criteria and identify potential innovative EE and RE measures. In six out of eight buildings, innovative EE/RE measures have been identified that meet above mentioned criteria for the innovation grants, including: heat pumps for space heating and/or sanitary hot water; lighting control systems; and PV emergency back-up

units with power storage battery. Investment costs for these measures are estimated at US$580,000, equaling around 28 percent of the total investment costs. Detailed energy audits and seismic assessments will be conducted in June-September 2018 to validate these findings and inform detailed designs for the buildings.

COMPONENT 2: Capacity building and technical assistance support (estimated US$974,000 RETF financing). This component will support capacity building, awareness raising and technical assistance support for the preparation and implementation of EE and RE investments. Specifically, this would include:

- *Capacity building for the identification, preparation and implementation of innovative EE and RE technologies*, including training and targeted technical assistance aimed at increasing the capacity and knowledge of local key stakeholders on innovative EE and RE technologies. The target audience will include local service providers (e.g. energy audit companies, design firms, local suppliers) as well as public stakeholders (e.g. ARIS, State Committee for Industry, Energy and Mining; State Agency for Architecture, Construction and Housing; State Inspectorate on Ecological and Technical Safety; etc.).
- *Awareness raising activities,* mainly aimed at capturing and dissemination achieved results of the innovative technologies for demonstration, awareness and project promotion purposes.
- *Technical support for preparation and implementation of EE and RE measures* for one annual batch of buildings retrofitted under the HSIP and the proposed RETF; specifically, this will include energy audits and seismic assessments for at least seven buildings selected under the HSIP, detailed designs and technical specifications as well as technical supervision of implemented EE and RE measures.

COMPONENT 3: Grant Implementation Support (estimated US$ 165,000 RETF financing). This component will provide Grant implementation support to ARIS, including: (i) PIU staff/ consultants (full-time technical expert throughout the project and a temporary procurement specialist until effectiveness of the HSIP); (ii) Grant-related operating costs; and (iii) annual audits of the Project accounts.

SAFEGUARDS

E. Safeguard Policies that Might Apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	X		
Natural Habitats OP/BP 4.04		X	
Forests OP/BP 4.36		X	
Pest Management OP 4.09		X	
Physical Cultural Resources OP/BP 4.11		X	

Indigenous Peoples OP/BP 4.10		X	
Involuntary Resettlement OP/BP 4.12		X	
Safety of Dams OP/BP 4.37		X	
Projects on International Waterways OP/BP 7.50		X	
Projects in Disputed Areas OP/BP 7.60		X	

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Borrower/Client/Recipient

Borrower : Kyrgyz Republic

Implementing Agencies

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