



# Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

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Concept Stage | Date Prepared/Updated: 30-Nov-2015 | Report No: PIDISDSC15172



## BASIC INFORMATION

### A. Basic Project Data

Country Kyrgyz Republic	Project ID P157079	Parent Project ID (if any)	Project Name Heat Supply Improvement Project (P157079)
Region EUROPE AND CENTRAL ASIA	Estimated Appraisal Date Nov 14, 2016	Estimated Board Date Jul 03, 2017	Lending Instrument Investment Project Financing
Sector(s) Energy efficiency in Heat and Power (70%), General energy sector (30%)	Theme(s) Infrastructure services for private sector development (10%);City-wide Infrastructure and Service Delivery (90%)	Borrower(s) Ministry of Finance	Implementing Agency Ministry of Economy,Bishkekteploset JSC

### Financing (in USD Million)

Financing Source	Amount
Borrower	0.00
International Development Association (IDA)	13.75
IDA Grant	11.25

Environmental Category

B-Partial Assessment

Concept Review Decision

Track II-The review did authorize the preparation to continue

Have the Safeguards oversight and clearance functions been transferred to the Practice Manager? (Will not be disclosed)

No

Other Decision (as needed)

### B. Introduction and Context

#### Country Context

**1. The Kyrgyz Republic with a GNI per capita (Atlas method) of USD 1,250 in 2014 remains one of the poorest countries in the Eastern Europe and Central Asia (ECA) region.** During 2003 to 2014, GDP growth averaged just above 4% annually, with significant variations from -0.5% in 2010 to 10.9% in 2013. Underlying these variations have been external shocks (world food and energy price shocks in 2008), domestic events (energy supply crisis in 2009 and political turmoil in 2010), and fluctuations in gold production stemming from both geological factors and ad-hoc events (accident at the Kumtor gold mine in 2012). Between 2006 and 2011, economic growth was inclusive with consumption among the bottom 40 percent's income growing at a faster pace than the average. In 2013, it was estimated that around 38% of the population lived in poverty and 2.8% lived in extreme poverty. The Kyrgyz Republic joined the Eurasian Economic Union (EEU) on August 12, 2015. Although accession is expected to facilitate trade within the Union (essentially through streamlined procedures at borders) it will also result in higher tariffs for imports from non-member countries



(particularly China). To make the most of its membership in the Union, the Kyrgyzstan will need to: (i) accelerate the process of convergence to EEU standards and technical regulations (particularly phytosanitary); and (ii) make further improvements to the investment climate so as to attract foreign investment in productive sectors. Looking forward, economic growth and poverty reduction will most likely be affected by the current economic situation in Russia that affects remittances to the Kyrgyz Republic.

**2. The energy sector of the Kyrgyz Republic, largely publicly owned, is critical for economic growth.** The sector accounts for about 4% of GDP and 16% of industrial production. Ensuring reliable and efficient access to energy services is key for the performance of the Kyrgyz economy and ranks among the Government's top priorities, as reflected in the National Sustainable Development Strategy 2013-2017.

#### Sectoral and Institutional Context

**3. Access to reliable and adequate heat supply is critical for the wellbeing of the population and the delivery of public services in the Kyrgyz Republic.** Given the cold climate and long heating seasons, lasting one-third to one-half of the year, access to reliable heating services is an essential need in the Kyrgyz Republic. However, in Bishkek and Tokmok alone, around 20 to 25% of residential and public heat demand remains underserved every year due to insufficient and unreliable heat and electricity supply in winter.

**4. Once the principal source for heating in the largest urban areas, district heating (DH) systems now serve about one fifth of the urban population.** Four state/municipally-owned companies (Electric Power Plants OJSC, Kyrgyzhilkommunsoyuz SUE, Bishkekteploset JSC and Bishkekteploenergo SUE) provide approximately 90% of the DH supply in the country. Small boiler houses, which are owned by municipalities or government agencies (e.g. Ministry of Education and Health) provide the balance. About 70% of the thermal energy is generated by the Combined Heat and Power (CHP) plant in Bishkek, providing heat to more than 70% of the households with access to DH. Heat generated at the CHP is transmitted and distributed by Bishkekteploset (BTS) to the more than 100,000 residential, public and industrial end-consumers. The remaining 80% of the urban households without access to centralized heat supply (around 490,000 households) rely on electric heaters (26%) or solid fuel fired stoves (55%) as their primary heating source. More than 80% of the households in rural areas (around 680,000 households) and around 73% of the low income households use coal or wood fired stoves to heat their homes.

**5. Supply reliability and service quality of DH is deteriorating.** The majority of DH assets were commissioned 20 to 50 years ago and are in poor condition due to their age as well as insufficient investments in maintenance and rehabilitation. In Bishkek, more than 70% of the steam and hot water networks operated by BTS are older than 25 years and have exceeded their service life. As a result, technical and commercial losses are very high – thermal energy and water losses in BTS' transmission and distribution network amount to 33% and 46% respectively of the heat dispatched from the CHP plant in Bishkek. Due to the dated assets and their poor condition, supply quality and reliability is also deteriorating – during the heating season in 2013, DH customers in Bishkek experienced more than 300 network breakdowns, which is a six-fold increase compared to the early 1990s. Heat and hot water supply in particular during peak hours and at the outskirts of the DH network are often inadequate, requiring customers to resort to back-up solutions, such as electric heating.

**6. Deteriorating DH services aggravate winter power shortages.** The deteriorating DH supply has increased the reliance on electricity as a primary or secondary heating source – around 35% of urban households use electricity for heating as their primary or secondary source. The widespread use of electricity for heating is the main driver of the growing residential electricity consumption during winter months – from 2009 to 2013, residential electricity consumption



increased by more than 60%. Combined with the poor condition of the aging power infrastructure and low hydropower output during winter, this increase in electricity load aggravates recurrent winter power shortages the country is facing.

**7. Due to the lack of access to centralized heat supply, a substantial share of households use inefficient solid fuel-fired heating solutions.** With the increase in natural gas prices over the last decade and the lack of access to DH, about 40% of urban households and more than 80% of rural households rely on inefficient and often polluting solid fuel-fired stoves. The quality and efficiency of most of these stoves is poor with detrimental health, social and environmental impacts. Women, who are responsible for household chores and spend more time at home, suffer the impact of poor heating the most. In the ECA region, the Kyrgyz Republic ranks among the two worst-affected countries for diseases resulting from indoor air pollution. Moreover, the use of inefficient solid fuel-fired stoves and boilers is estimated to result in roughly 20 to 30% higher coal consumption (and thus, household expenditures on coal) compared to more efficient models. Households spend on average around 6-7% of the income on energy with expenditures for solid fuel accounting for the majority in areas outside of Bishkek.

**8. The Government recognizes the importance and momentum for improving access to reliable and efficient heat supply.** Reducing the reliance on electricity for heating purposes during winter months, cutting technical and commercial losses in the DH system and improving access to reliable and efficient heating services for the population figure among the key priorities of the Government in the heating sector, as reflected in the National Sustainable Development Strategy and the long-term Strategy for Heat Supply (2004-2015). The Government recently implemented important steps to improve the financial and operational performance of the DH sector, including: (i) adoption of a Medium-Term Tariff Policy for heat and hot water, which envisages a more than double increase in weighted end-user tariff for heat between 2014 and 2017; in 2015, end-user tariffs for heat (weighted average tariff: KGS907/Gcal or USD13/Gcal) were increased already twice by 43% and 17% respectively; and (ii) ongoing modernization of the CHP plant in Bishkek to improve heat generation reliability and efficiency. In addition, Gazprom acquired the majority stake in the former Kyrgyzgas and plans to invest up to KGS 87 billion (USD1.2 billion) by 2019 in the reconstruction of the existing gas network, the construction of local gas networks in three northern cities and the construction of a North-South pipeline – this is expected to increase access to natural gas as an alternative heating option.

**9. The activity will build on and complement the Bank's strong dialogue in the energy sector in the Kyrgyz Republic.** Specifically, the activity will build on: (i) the results and findings of the recently completed urban heating and energy efficiency assessment, which identified DH rehabilitation and improved efficiency of individual heating technologies among the economically most viable options to meet public and residential heat demand; (ii) the recommendations of a detailed technical and economic assessment conducted with BTS on how to prioritize investments to achieve the highest impact per dollar invested in terms of reliability and efficiency improvements; (iii) a comprehensive support program to the regulatory agency in the energy sector to develop and implement a transparent tariff setting methodology for electricity, heat, hot water and gas, as well as transparent performance and reporting mechanisms for power and DH companies; (iv) policy reforms supported under an Energy Sector Development Policy Operation (DPO) and an upcoming DPO series with energy as one of the key pillars; and (v) results achieved and lessons learned from a previous Power and DH Rehabilitation Project and the Emergency Recovery Project, which included DH activities.

**10. The proposed operation would support the Government's objectives in the heating sector and help address recurrent winter energy shortages.** Specifically, improving reliable and efficient heat supply for households with and without access to centralized heat supply would support the Government's long-term strategy in the heating sector in the following ways: (i) support a strategic shift from increasingly meeting heat demand through electricity towards proving access to more reliable and efficient alternative heating options; (ii) complement the ongoing investment to modernize the CHP plant by ensuring that the expected benefits of the investment reach end-users; (iii) ensure that the



substantial heat and hot water tariff increases are accompanied by improved heat supply quality and reliability as well as the ability for customers to better control their heating bills.

**11. The propose operation is also expected to include a range of citizen engagement activities.** Specifically, as part of project preparation, the following areas will be further explored: (i) strengthening customer orientation of BTS, e.g. through improved billing practices, strengthening of the current customer management/ communication system (e.g. call centers) and introduction of customer satisfaction survey instruments; (ii) conducting citizen awareness campaigns on improved individual heating technologies and centralized heating services; and (iii) other citizen engagement activities and mechanisms that help minimize social risk, build beneficiaries' awareness, increase acceptability of sector reforms and/or enhance project sustainability.

#### Relationship to CAS/CPS/CPF

**12. The proposed operation is aligned with and supports the Country Partnership Strategy (CPS) for 2013-2017.** The CPS highlights public service delivery as well as maintenance of scarce natural resources and physical infrastructure, including energy, as one of the three areas of focus in 2013-2017.

**13. The proposed project would support the Bank's twin goals and the sustainable energy for all (SE4all) initiative.** Poor reliability and efficiency of heat supply during cold winter months has significant economic costs and negatively impacts the living conditions of the population, particularly the poor. The project would support the World Bank's twin goals of reducing poverty and increasing shared prosperity as well as contribute to the goal of achieving universal access to modern energy under the SE4all initiative through:

- *Reducing significant economic costs of underserved demand:* Due to unreliable heat and electricity (partly used for heating) supply in winter, there is significant underserved demand every winter. Estimates suggest that unmet demand for both power and heating during winter exceed 20% and involves significant economic costs. In 2011, economic costs of unmet electricity demand alone was estimated at US\$610 million. Because the interlinkage between heat and power consumption patterns in the Kyrgyz Republic, the economic costs of underserved demand in both the heat and power sector could be reduced by decreasing the duration and frequency of DH outages and improving the reliability and adequacy of individual heating systems in use.
- *Reducing winter power shortages and improving living conditions of households with access to DH:* Improving heat supply reliability in particular of the DH system would also help to reduce winter electricity overloads which are particularly pronounced in Bishkek, as many households rely on electric heating either because they don't have access to DH or DH alone is not sufficient to meet their heat demand. Data from power distribution company show that the number of power outages tend to be much higher in the first and fourth quarter of the year, i.e. the beginning and the end of the heating season, coinciding with the period before and after provision of DH supply. According to a representative household survey in 2014 (World Bank), around 28% of the households with access to DH complain about low comfort levels in buildings, i.e. rooms being cold or barely warm.
- *Improving access to efficient and cleaner heating technologies:* According to household surveys, in particular rural and low income households (73 and 68% respectively) rely on inefficient and often polluting solid fuel-fired stoves with resulting negative environmental and health consequences. Based on the results of a comprehensive heating assessment conducted by the Bank, providing more efficient and less polluting heating technologies for individual households is one of the economically most viable options to improve heat supply services for the population, and can bring substantial benefits in terms of fuel (cost) savings, improved indoor comfort levels (i.e.



indoor temperature and air pollution) and environment (i.e. reduced coal consumption and ambient air pollution).

### C. Proposed Development Objective(s)

The Project Development Objective is to improve access to reliable and efficient heat supply in the project target areas.

#### Key Results (From PCN)

14. The proposed key results indicators for the project include:

- Projected lifetime energy savings (MJ)
- Number of people that gained access to more energy efficient heating systems, disaggregated by socio-economic status and gender
- Percentage of people who perceive improvements in heating services in the target areas, disaggregated by socio-economic status and gender
- Number of service interruptions in BTS' DH network due to pipeline breakdowns

### D. Concept Description

15. The proposed operation will have two components:

**16. Component 1: Improving supply reliability and efficiency of the DH system.** This component would support investment and technical assistance to improve the reliability and efficiency of the DH system operated by BTS, and include 2 subcomponents:

**17. Subcomponent 1.1: Investment program for DH rehabilitation (estimated US\$19.5 million).** This subcomponent will support implementation of priority measures to rehabilitate the DH network operated by BTS. Overall, the financing needs for the rehabilitation of BTS' DH network are estimated at around US\$170 million. Taking into account limited funding availability while ensuring the highest impact per dollar invested, three criteria are used to prioritize the measures: (1) highest economic return for investment as measured by the economic internal rate of return; (2) impact on supply reliability as measured by the technical assessment of DH assets, including breakdown statistics; and (3) technical interlinkages between various measures proposed. As a result, the preliminary scope for subcomponent 1 is proposed to include: (i) reparation of 1,700 existing individual heat substations (building level) including installation of heat and hot water meters, (ii) replacement of the most dilapidated and critical sections of the transmission and distribution network, and (iii) installation of 191 new individual heat substations (building level) with heat and hot water meters. Based on the proposed prioritized investment plan developed as part of World Bank technical assistance activity and preliminary discussions, EBRD may provide US\$10 million parallel financing.

18. The proposed priority investment package for IDA financing of around US\$19.5 million is expected to generate significant benefits in terms of reliability and efficiency improvements. Specifically, it is estimated that thermal energy and water losses can be reduced by more than 37 and 39% respectively. Further, supply reliability and service quality would be improved through investments in better temperature, flow and pressure control at building level (i.e.



investments in substations including heat and hot water meters), and through targeted investments in upgrading transmission/distribution pipelines in the most dilapidated conditions located at critical network sections. Beneficiary feedback instruments will be used to assess improvements in customer satisfaction with heating services provided by BTS.

**19. Subcomponent 1.2: Technical assistance (estimated US\$1 million).** This subcomponent will finance capacity building and implementation support for BTS and may include: (i) capacity building and training to improve operational practices within BTS; this may include improved and more efficient customer management systems (including existing call centers), more transparent and efficient billing systems, better operational and maintenance practices or improvements in other areas that will be defined during project preparation; (ii) consultancy services to support BTS in preparation and implementation of investment measures; and (iii) implementation support for project management, including monitoring and evaluation and incremental operating expenses of BTS. The team aims to mobilize recipient-executed ECA Development grant resources to support technical assistance activities during preparation.

**20. Component 2: Improving access to efficient individual heating technologies (estimated US\$4.5 million).** This component would focus on improving access to more efficient heating technologies for individual households without access to DH (e.g. incentivizing switch to efficient gas heaters; improving combustion efficiency of solid-fuel fired stoves). The component will include 2 subcomponents:

**21. Subcomponent 2.1: Investment program for efficient individual heating technologies (estimated US\$3.5 million).** As part of this subcomponent, a scalable financing mechanism will be developed and implemented to incentivize households without access to centralized heating and currently using inefficient and often polluting heating stoves to switch to more efficient models. The design of the financing scheme will be based on the results of an ongoing detailed market assessment<sup>1</sup> and may include a combination of credit and grant (subsidy) funds. Options that will be explored include results-based financing instruments, credit-lines with local (micro-) finance institutions as well as a subsidy mechanism. The latter will be designed based on the results of the detailed cost-benefit analysis between current heating stoves in use and more efficient models as well as the findings of household surveys and focus group discussions on households' willingness and barriers to switch to more efficient heating technologies. The incentive schemes could be designed to: (i) ensure inclusion of poorer income and female-headed households; (ii) reward the use of models with higher performance (e.g. buy down the cost of new high efficiency stoves); and/or (iii) promote rapid penetration of new equipment.

**22.** Eligibility criteria for households, products and potentially producers will be developed during preparation to ensure: (i) adequate performance of products in terms of capacity, fuel and combustion efficiency, emissions, durability and safety standards; (ii) production capacity, quality control, warranty and other important supply aspects for producers of stoves; and (iii) eligibility criteria for households in terms of current primary heating appliances used, income levels, or other relevant criteria.

**23.** Depending on the availability of additional resources during preparation (e.g. from Trust Funds or bilateral donors), a pilot phase will be implemented during the heating season 2016/2017 to test the proposed financing and implementation scheme, monitor and evaluate results of eligible stoves in terms of fuel and cost savings, improved comfort levels and other benefits, and support project pipeline development. This would help to adjust the design of the proposed program based on the results and findings of the pilot phase.





**24. Subcomponent 2.2: Technical assistance (estimated US\$1 million).** This subcomponent would provide technical assistance to help improve the enabling environment for the production and use of more efficient stoves and to conduct public awareness and outreach campaigns. Specifically, potential areas for support may include: (i) developing regulations, safety norms and standards, testing methods, procedures and certification processes for efficient heating solutions (based on international/regional experience to the extent possible); (ii) capacity building and training for local stove manufacturers and other key stakeholders (e.g. financial institutions, service providers, center for standardization, etc.); (iii) conducting public outreach and awareness campaigns on the benefits of more efficient heating technologies in terms of energy consumption, expenditures, comfort levels and air pollution; and (iv) implementation support for project management, including monitoring and evaluation and incremental operating expenses of the Project Implementation Unit (PIU) responsible for Component 2. Data collected as part of the project (e.g. beneficiary surveys) will be gender-disaggregated where possible.

## SAFEGUARDS

### A. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The planned rehabilitation of the DH infrastructure will be done in Bishkek, the capital city of the Kyrgyz Republic, and involve repair/replacement of pipelines and of individual heating substations. The individual heating substations will be located in the basements of multi-apartment buildings. The rehabilitation of heating pipelines will be implemented in residential areas, where no protected areas and/or valuable natural habitats and physical cultural resources are located. The investment program for efficient individual heating technologies will be designed as a national program with specific target households and potential geographical focus (e.g. urban areas, geographic regions).

### B. Borrowers Institutional Capacity for Safeguard Policies

The proposed project will be implemented using two structures: (1) a PIU will be established within BTS to manage implementation of the DH component; and (2) an implementation structure under the Ministry of Economy will be defined during project preparation for implementation of the individual heating technology component – options that will be explored include a PIU within the Ministry and/or within a (state-owned or independent) entity able to champion development and implementation of the efficient stove program. BTS is familiar with World Bank safeguards requirements as it was involved in the implementation of two previous World Bank-financed projects (Power and DH Rehabilitation Project; Emergency Recovery Project) which supported similar type of investments as are proposed under the current project. Its environmental performances during project implementation of the Emergency Recovery Project (closing date December 2013) was qualified as satisfactory. The current status of BTS' institutional capacity with regards to safeguards will be assessed during project preparation. Based on the results of the assessment, the project will support safeguards capacity building activities, if needed.

### C. Environmental and Social Safeguards Specialists on the Team

Arcadii Capcelea, Ekaterina Romanova

### D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	OP 4.01 on Environmental Assessment (EA) is triggered as the proposed activities under Component 1 (DH Rehabilitation) might generate some environmental impacts such as dust, noise, soil removal and destruction, occupational hazards, traffic disruptions, construction wastes, etc. To address these issues the borrower will prepare an Environmental Management Plan (EMP) which will be based on World Bank and national EA rules and





		procedures. The EMP will provide necessary mitigation and monitoring activities to be followed during project implementation along with the implementing arrangements, including with regard to hazardous substances such as asbestos. For Component 2, as part of the eligibility criteria and in accordance with a planned Operational Manual, the EMP will specify the following: adequate performance of products in terms of capacity, fuel and combustion efficiency, emissions, durability and safety standards. The document will be disclosed on the BTS website and publicly consulted in Bishkek city with participation of all involved stakeholders and local population.
Natural Habitats OP/BP 4.04	No	OP4.04 is not triggered as project activities will be implemented within city boundaries and no Natural Habitats (Forest areas) will be affected.
Forests OP/BP 4.36	No	
Pest Management OP 4.09	No	
Physical Cultural Resources OP/BP 4.11	TBD	It is to be determined if OP4.11 on Physical Cultural Resources will be triggered since it is not yet known if any buildings which are specified in the list of national physical cultural resources will be included in the project. This will be clarified during project preparation and the EMP will reflect requirements for EA of such buildings, if any.
Indigenous Peoples OP/BP 4.10	No	
Involuntary Resettlement OP/BP 4.12	Yes	While no physical displacement or land acquisition is expected under this project, activities under Component 1 -- such as excavation and rehabilitation of transmission and distribution networks - may result in temporary land acquisition, access restrictions and/or disruption of livelihoods. Based on this, OP/BP 4.12 on involuntary resettlement has been triggered. At this time, the exact locations and the scale of civil works are yet to be clarified, thus a Resettlement Policy Framework (RFP) will be prepared and disclosed before appraisal. Once the project design is finalized and the project impact is known, a Resettlement Action Plan (RAP) will also be prepared during project preparation, if needed.
Safety of Dams OP/BP 4.37	No	
Projects on International Waterways OP/BP 7.50	No	
Projects in Disputed Areas OP/BP 7.60	No	

## E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage ISDS

Oct 20, 2016

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal-stage ISDS

The EMP and RFP will be prepared in June - October, 2016.

## CONTACT POINT



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## APPROVAL

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