Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 23-Jun-2022 | Report No: PIDC33904

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Kyrgyz Republic	P177467		Kyrgyz Republic Air Quality Improvement Project (P177467)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EUROPE AND CENTRAL ASIA	Nov 01, 2022	Jan 16, 2023	Environment, Natural Resources & the Blue Economy
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance	Ministry of Natural Resource , Ecology and Technical Supervision	

Proposed Development Objective(s)

The Project Development Objective is to strengthen the government capacity of the Kyrgyz Republic to manage air quality and promote clean residential heating solutions and urban greening measures in Bishkek.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	50.00
Total Financing	50.00
of which IBRD/IDA	50.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	50.00
IDA Credit	50.00

Environmental and Social Risk Classification	Concept Review Decision

Moderate	Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

1. The Kyrgyz Republic, a land-locked and low-middle-income country with about 6.6 million population, has been facing challenges in sustaining and greening its growth. While Kyrgyzstan GDP grew at an average rate of 4.3 percent over the period 2016-2019, the growth collapsed to -8.6 percent in 2020 due to COVID-19 pandemic. In 2021, the country's economy rebounded with 3.6 percent growth, albeit offset by soaring inflation of 11.2 percent driven by high food and fuel prices . Reduced labor income and remittance caused by COVID-19 pandemic and inflation pushed an additional 700,000 people (11 percent of the population) into poverty in 2020 , with a poverty rate at 25.3 percent. The country's economic growth depends on intensive resource use (i.e., mining industries), leading to the resource intensity four times higher than the subregional and regional average . Some urban areas are going through rapid expansion without adequate infrastructure to cope with growing population. Despite the high share of renewable energy in electricity generation (Hydropower >90%), the overall energy sector is still dominated by the use of fossil fuels (oil 48% and coal 17%) due to heavy dependence on fossil fuels for heating. Especially, the residential sector, the largest energy consumer due to the high demand for heating, is predominantly served by coal. All these factors have contributed to deterioration of the environment, including worsening air pollution, which adversely affects human health, quality of life and economic productivity.

2. The ongoing war in Ukraine has brought further severe economic consequences for Kyrgyzstan. In the Kyrgyz Republic, 83 percent of remittances originated from Russia in 2021 Q1-Q3 and its contribution to GDP was 31 percent in 2020. Remittance flows from Russia are expected to be disrupted due to sanctions and the exclusion of Russia from the payment system. The impact of the Russian war in Ukraine is estimated to be the highest in the Kyrgyz Republic among any other Central Asian countries .

3. While the country is grappling with the economic consequences of Covid-19 crisis and the ongoing geo-political conflict in the region, climate change brings yet another set of risks to the country's long-term development and stability. The Kyrgyz Republic is one of the most vulnerable countries to climate change in the Europe and Central Asia region. Low socio-economic development, inadequate infrastructure, and a high dependency on climate-sensitive sectors (agriculture and hydropower) result in greater vulnerability to climate-related impacts. For example, the intensification and expansion of drought-related land degradation will severely affect land productivity alongside desertification and air pollution. Climate-related risks disproportionately impact the poor in the country, who live in the rural areas and depend on income mainly from agricultural outputs. Loss of hydropower capacity due to climate variability could lead to increased use of fossil fuels, and thereby worsen air quality and increase environmental degradation alongside increased greenhouse gas (GHG) emissions.

4. In early 2018, the Kyrgyz Parliament adopted the "Concept of Kyrgyzstan as a Green Economy Country", a first step in the formal policy process to develop a green economy programme. The 'Programme for the Development of Green Economy (2019-2023)' was enacted in 2019, setting out a strategy and plan to create the basis for the introduction of green economy approaches to the development of the national economy by 2023. The Programme focuses on seven priority areas, including green energy, green agriculture, green industry, low carbon and environmentally friendly

transportation, sustainable tourism, waste management, and green cities.

Sectoral and Institutional Context

Status of air pollution in Kyrgyz Republic

5. Ambient air pollution has been a major health risk to the population and also a cause of significant economic loss in the Kyrgyz Republic. This is particularly acute in Bishkek, its capital and the largest city. Fine particular matter (PM2.5), which is the pollutant of the gravest health concern according to the WHO, attributed to 2,586 deaths (11.2% of all annual death) and 5,319 years lived with disability in the Kyrgyz Republic in 2019 , leading to significant labor loss and low labor productivity. The annual cost of health damage from ambient PM2.5 pollution in 2019 in the Kyrgyz Republic is estimated at USD 1,147 million (PPP), about 5.1% of GDP equivalent5. International air quality standards (e.g. WHO, EU, US) are frequently exceeded, especially in respect of PM2.5, as well as SO2 (which in turn contrinutes to secondary PM2.5 formation). For example, the highest average daily concentrations of PM2.5 in Bishkek in the period, 2015-2020 was over 200 µg/m3, compared to 15 µg/m3 in the WHO air quality guideline (Fig. 1) . Health impacts from air pollution have become even more critical during the COVID-19 pandemic as the health of people living in areas with polluted air is even more vulnerable to COVID-19 impact .

Figure 1 (left) Air quality monitoring data (PM2.5) between 2015-2020 (source: KyrgyzHydromet) and (right) PM2.5 emission source apportionment of air pollution in Bishkek, 2018 (Source: UNDP/UNEP study)

6. While there is no comprehensive, up-to-date source apportionment study available for Bishkek, heating in winter and transport are considered the major sources of ambient air pollution. The recent emission inventory carried out through a study funded by UNDP/UNEP reveals that PM2.5 emissios arise from a number of different sources (Fig 1, right). Residential heating is the largest contributor of PM2.5 emissions followed by road transport. Repeated wintertime peak concentrations of PM2.5 (Fig 1, left) is attributed to use of solid fuels (largely coal) and even waste and textiles in residential heating. According to the air pollution map from local NGO, MoveGreen, air quality in north and northwest regions of Bishkek is particularly poor, where many residential houses are not connected to district heating systems and mainly rely on independent solid fuel-based heating solutions.

7. The heating sector - one of the major contributors to air pollution - mostly relies on inefficient and high polluting coal-based technologies in buildings with significant heat losses. Around two thirds of households nationwide and one fifth of households in Bishkek rely on traditional and highly inefficienty (efficiency factor varies around 25%-40%) coal-fired stoves and simple coal-fired low-pressure boilers (LPBs) as their primary heating sources , which emit large amounts of carbon monoxide (CO) and PM2.5, causing both indoor and outdoor air pollution. Moreover, buildings are generally in poor condition, operating at below comfort standards with high energy intensity. District heating (DH), once the principal heat source for the largest urban areas, is also deteriorating. The majority of DH assets were commissioned 20 to 50 years ago and are in poor condition. Some of the public heat generation facilities such as the combined heat and power units and local boiler houses, are coal-based. Tariffs for heat and electricity for households are well below cost-recovery levels; as result most heat suppliers operate at a loss and do not have sufficient funds for proper maintenance and rehabilitation, resulting in inefficiency and poor quality of service.

8. The air quality is exacerbated by unfavorable meteological and geographical conditions in and around Bishkek. In Bishkek, the meteorological conditions featured with low wind speeds and frequent temperature inversions make pollutants easily accumulated, leading to high concentration within the city. The city of Bishkek has limited green spaces (3.5 m2 per capita compared to the recommended green space by WHO, minimum 9 m2 per capita) and vegetation coverage which could have reduced a population’s exposure to air pollution through the interception of airbone particles.

Bishkek has been observing frequent sandstorms, and according to some forecasts, the sandstorms will have increasing occurrence in the Kyrgyz Republic due to glacier melting, land degradation and loss of green cover.

9. **Lack of institutional capacity, sound policy framework, as well as lack of an effective air quality management system are among many factors that contribute to the air quality challenges**. Until recently, no institution was responsible for planning, analyzing, prioritizing, and developing strategies that are necessary for a well-functioning air quality management system. Institutional arrangements for air quality management are complicated due to fragmented and unclear division of responsibilities across ministries, especially between MNRETS and the Ministry of Emergency Situations. The policy and regulatory framework and technical methodologies for emission estimation, prioritization and control are outdated, using Soviet-era approaches and standards that do not incorporate recent scientific developments in the air quality area, nor the relationship between air pollution and health. The infrastructure for air quality monitoring and analysis in Kyrgyz Republic is underdeveloped for informed decision-making. The air quality is mainly measured by manual sampling that do not meet the best international practices, except one automated sampling station, which requires frequent repair and maintenance without no capacity to handle them. The national and local laboratory infrastructure is also insufficient to measure important air quality pollutants (e.g. VOC, PAH), but also lacks capacity to conduct comprehensive air quality analyses or source apportionment studies.

Recent progress on air quality agenda undertaken by the Government of Kyrgyz Republic and remaining priorities

10. **Increased public pressure caused by the frequent occurrence of high air pollution levels has prompted the Government to take action to tackle air pollution.** In 2017, the Government established and formally adopted norms for particulate matter, PM10 and PM2.5 for the first time. It adopted the 'Law on the protection of ambient air' and the 'Regulation on air pollution'. After a recent institutional restructuring, the State Committee on Environment has been upgraded to the Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS), with the mandate for the air quality agenda, among other environmental functions. The Government has recently developed the "Plan of Comprehensive Measures to Improve the Environmental Situation in the City of Bishkek and Sokuluk, Alamudun districts of the Chui region for 2021-2023" (hereafter, "Plan"). The Plan proposes measures in nine different focus areas, many of which are closely linked to address air pollution. However, the Plan lacks prioritization, feasibility and resources for their actual implementation.

11. **Some measures, mainly in transportation and waste management, have started being implemented but critical areas for air quality improvement remains no progress**. The Government has started implementing some of the identified measures in the Plan, such as creating a favorable environment for electric cars, improving and electrifying public transport , and building a new sanitary landfill and mechanical biological treatment plants , financed by other development partners. However, no action has been taken yet for air quality monitoring improvement and switching to cleaner heating options in the residential sector, either due to lack of finance or detailed planning.

12. **The government is actively looking for opportunities to green the heating sector and reduce air pollution through cleaner fuels, efficient and advanced heating technologies, and building energy efficiency.** The government recently announced an energy sector development and reform roadmap with one Environmental Sustainability Pillar focusing on accelerating the deployment of solar, hydropower, and other forms of renewable energy while enhancing energy efficiency and promoting clean heating solutions. . Improving access to reliable and efficient heating services for the population and reducing the reliance on solid fuels for residential heating purposes are among the key priorities of the Government in the heating sector, as reflected in the National Sustainable Development Strategy and the Strategy for Heat Supply. Natural gas would still play a role here, however serving as a transition fuel in district heating systems and in combination with sustainable heat sources. Based on General Gas Supply and Gasification Plan for Kyrgyz Republic by 2030, it sees investment in urban gasification as a priority transition option to cleaner decentralized heating sector by

gasifying at least 60 settlements (or 90,000 households) by 2023. Moreover, the government also recognizes that energy efficiency investments—especially in buildings—will be critical to further reducing the country's demand side carbon footprint and bringing it to greener path, while also contributing to air pollution reduction.

13. **The Government recognizes the role of urban greening in tackling the city's growing pollution and in providing better quality of life to residents.** Urban green spaces can remove air pollution through limiting dust resuspensions. and generate health and recreational co-benefits for residents. Urban green spaces also influence micro-scale meteorological conditions and have proven effect on reducing temperature especially in the summer months, and hence reducing energy consumption and related GHG emissions. Urban greening agenda has been included in the recently prepared Plan to complement source-oriented measures as well as in line with "green cities" concept under aforementioned, "Programme for the Development of Green Economy (2019-2023)". Potential areas for parks and landscaping activities have been identified in the city development planning document "Concept of Urban Development Scheme of the Greening Territories of the Natural Complex of Bishkek (2005)". However, this strategic direction and concept has not led to detail planning to implement and has not been supported by lack of resources.

14. **This project will support the Government of the Kyrgyz Republic to address the existing gaps in air quality management system and enhance the government's efforts to reduce PM2.5 as well as GHG emissions for climate mitigation through targeted investments in Bishkek.** The proposed project will build on past and ongoing efforts to address air quality in the Kyrgyz Republic, with initial focus on Bishkek. The project aims to establish a foundation for the country's overall air quality management framework, which need long-term and cross-sectoral efforts. The project will support building the policy and institutional environment related to air quality management through modernization of infrastructure associated with air quality monitoring, analysis and data management and capacity building of important stakeholders. The project will also support a range of technical measures to reduce air pollution in Bishkek, such as switching to cleaner and more energy-efficient residential heating technologies, and supporting the city's urban greening agenda in target districts. Both measures could contribute to improving air quality, health and wellbeing of urban residets, as well as reducing GHG emissions, thus support its climate change mitigation commitment.

Relationship to CPF

15. **The proposed project is aligned with the World Bank's twin goals to reduce poverty and boost shared prosperity in Kyrgyz Republic, as well as the overarching goal of Country Partnership Framework (CPF, 2019-2022).** Air pollution negatively impacts the health of the population. People with low income are exposed to greater risks of death and illness from particle pollution due to limited access to proper health care and higher traffic exposure. Serious illnesses caused by air pollution also affect their employment and productivity. Also, risk of reliable and clean heating supply during the winter negatively impacts the living conditions of the population, particularly the poor. The proposed project supports two objectives in CPF, namely objective 7, develop human capital, and objective 9, enhance resilience to climate change and disaster. The proposed project will help to reduce air pollution which is responsible for human capital loss, especially through premature death, and reduced labor productivity. This project also contributes to climate change mitigation by increasing uptake of cleaner and energy efficient heating options in the residential sector.

16. **The proposed project also contributes to the World Bank Group Climate Change Action Plan (2021-2025) and the government's updated Nationally Determined Contribution, 2021 (NDC).** The government has set the mitigation goal to reduce GHG emissions by 36.61 percent in 2025 and 43.62 percent in 2030 with international support. The energy sector, accounting for around 60% of all GHG emissions in the country, is a priority area in its mitigation commitment. The proposed activities, particularly supporting the replacement of coal-based heating supply to low

carbon and cleaner option, are fully aligned with the measures proposed in the updated NDC, particularly, measure 1.7, reconstruction and improvement of the heat supply system of the city of Bishkek. The enhancement of existing and establishment of new urban green spaces will overall generate further climate mitigation and adaptation benefits in support of the country's NDC goals.

C. Proposed Development Objective(s)

Note to Task Teams: The PDO has been pre-populated from the datasheet for the first time for your convenience. Please keep it up to date whenever it is changed in the datasheet. ***Please delete this note when finalizing the document.***

17. The Project Development Objective is to strengthen the government capacity of the Kyrgyz Republic to manage air quality and promote clean residential heating solutions and urban greening measures in Bishkek.

Key Results (From PCN)

The following results indicators are proposed.

(i) Cities with AQ management plans and operational AQ monitoring network
(ii) Households adopting or connected to cleaner and/or more efficient heating technologies (Number)
(iii) Public area under green space in Bishkek (ha)

D. Concept Description

18. Addressing air pollution in Bishkek will require cross-cutting efforts in the long term. This project will help the government build a model of a multi-sectoral approach and sustained air quality improvement, as well as will support investments in the following three areas: (i) strengthening of the overall air quality management system (component 1); (ii) implementation of cleaner heating solutions in Bishkek (component 2); and (iii) implementation of urban greening measures (component 3). Together, these activities aim to contribute to reducing ambient PM2.5 air pollution, thus reducing the negative health impact on the population in the long term. These areas have been prioritized based on (i) the ongoing technical advisory and analytical work supported by Korea Green Growth Trust Fund (KGGTF) under the Central Asia: Climate and Environment (CLIENT) (P170870) regional program, and (ii) the current implementation situation in the country including engagement of other development partners. The ongoing advisory and analytical work will further inform and support the final design and implementation arrangements of the planned activities.

Figure 4 Theory of Change

Component 1: Strengthen Air Quality Management System (USD 7 million)

19. This component aims to strengthen the overall air quality management (AQM) system both at national and city level. This project will finance key elements of air quality management system including establishing and operationalizing air quality management framework development; improving air quality data collection analysis, and dissemination; strengthening compliance monitoring capacity and law-enforcement function of environmental and technical supervision agencies related to air quality.

Subcomponent 1.1: Establishing and operationalizing air quality management framework

20. The sub-component will support establishment and operationalization of air quality management framework both

at national and city level (with an initial focus on Bishkek to start with); as well as coordination mechanisms within and between the national and local levels. The type of activities, envisaged to be supported, include: (i) establishing and operationalizing both National and Bishkek AQ Management Coordination/Monitoring Committee (setting up a secretariat and/or working groups, organizing meetings of the coordination/monitoring committee, organizing national level workshops, etc. for the next 5 years); (ii) establishing and operationalizing a coordination mechanism between the national and local (Bishkek) level to facilitate air quality management and resolve implementation bottlenecks as responsibilities for tackling key sources of pollution span across both national and local level; (iii) strengthening overall institutional, policy and regulatory environment relating to AQ management (eligible activities and analytics to be supported would need to be further defined. The envisaged activities could include: update of AQ legislation, revision of AQ standards, update of emission inventory methodologies, etc.)

Subcomponent 1.2 Improving AQ Data Collection, Analysis and Dissemination:

21. This subcomponent will finance investments to improve the overall air quality data management, including data collection, procedures for update and verification, data analysis and communication. The envisaged activities of this sub-component include: (i) expansion of the ambient air quality monitoring network by adding new automatic monitoring stations in Bishkek, as well as potentially in other big cities (e.g. Osh and, Jalalabad); (ii) expansion of meteorological monitoring capabilities for atmospheric parameters needed for air pollution forecasts and analyses; (iii) upgrading the air pollution testing laboratories, supporting their accreditation and implementation of QA/QC procedures etc; including procurement equipment to enable testing for additional parameters (e.g. heavy metal), physical improvement of the laboratory infrastructure and IT systems; (iv) establishment of an integrated air quality and GHG emissions inventory (national and city level), including GIS mapping of pollution; (v) establishment of an air quality data management system/platform including a user-friendly air quality portal and/or public displays in highly-populated areas to disseminate air quality information to the public (Procurement of IT systems and associated infrastructure), as part of a unified environmental monitoring and reporting system, planned by the MNRETS; and (vii) technical capacity building of local experts and departmental staff in the field of air pollution monitoring, analysis, modelling, etc.

Subcomponent 1.3 Strengthening compliance monitoring and law-enforcement functions of environmental and technical supervision agencies:

22. This subcomponent will focus on strengthening the institutional, regulatory and policy environment to enable improved compliance monitoring and law enforcement functions of the relevant environmental and technical inspection agencies through provision of necessary equipment, infrastructure and capacity building. While the specific activities/investments to be funded under this subcomponent will be further analyzed as part of the ongoing ASA on air quality management, and finalized during project preparation, the following initial set of activities/investments have been already pre-identified by the respective agencies : (i) procurement of monitoring equipment such as emission analyzers for spot checks of emissions from specific industries; (ii) support for regulatory reforms to improve compliance monitoring and law-enforcement functions following international best practices; and (iii) capacity building for improved compliance monitoring and law-enforcement in the area of air pollution.

Component 2. Accelerate the adoption of cleaner heating solutions (USD 26 million)

23. This component aims at increasing uptake of cleaner heating options in the residential sector both at the centralized heating system and decentralized heating systems in multi-apartment buildings and individual houses. It will replace selected coal-based stoves and boilers that supply heat to multi-apartment buildings and individual houses and ones at district heating supply network with new, more efficient technologies and/or cleaner fuels, while reducing fossil fuel-based energy demand.

Subcomponent 2.1 : Support conversion of coal fired boilers in centralized systems to cleaner alternatives:

24. This subcomponent will support the fuel switch from coal to cleaner alternatives such as gas and renewable energy in selected boiler houses managed by the Bishkekteploenergo Municipal Enterprise, which provides heat to some of the multi-storied apartment buildings and social facilities. The activities to be financed will be identified and selected based on several parameters, including: (i) identification of priority investment and contribution to the PDO; (ii) technical and economic justification in terms of urgency and potential impact, and (iii) readiness for implementation, including in terms of environmental and social aspects.

Subcomponent 2.2: Support cleaner decentralized heating and hot water solutions at individual houses and multi-apartment buildings.

25. This subcomponent will support switching to cleaner heating and hot water supply options in individual houses and multi-apartment buildings, which are not connected to district heating network and rely on solid fuels for heating and hot water supply purposes. The list of options to be further proposed for investment could include electric boilers, ground-to-air heat pumps, air-to-air heat pumps (inverter air conditioner technology), solar water heaters, and the combination of technologies best suited for multi-apartment buildings/individual houses, depending on their feasibility.

26. To increase the takeup for this subcomponent, a sustainable financing and delivery scheme will further be established which will potentially include some grant from the government to ensure affordability. Such scheme should be worked out through households surveys and extensive discussions with relevant stakeholders, while also drawing lessons from several ongoing projects in this area and international experience. It will be developed in consultation and collaboration with government and other key stakeholders during project preparation.

27. It is also likely that strengthening electricity distribution network including substations and lines may be needed at selected locations to support the deployment of advanced heating technologies using electricity such as heat pumps (inverter air conditioner technology). The potential scope and estimated cost of this activity will be identified and consulted with the government during project preparation.

Subcomponent 2.3: Support policy, regulatory and institutional measures for promoting cleaner heating solutions (USD 1 million).

28. Building on the ongoing engagement, this component will support the development and adoption of appropriate institutional, policy and regulatory measures on cleaner heating and hot water supply solutions, including the development and adoption of improved standards and codes for heating appliances and buildings, market development and capacity building, development and implementation of communications and outreach programs to homeowners, and other community mobilization initiatives. It will support technical studies on the design and implemenetation of potential investment projects, including feasibility studies for sustainable heating opportunities and building energy efficiency programs. It could also finance awareness raising and capacity building activities for government agencies, component participants and stakeholders on clean heating solutions.

Component 3: Improve Urban Greenig (USD 14.5 million)

29. This component will support urban greening in selected areas of Bishkek to contribute to air pollution management and the wellbeing of urban residents, particularly support implementation of urban greening measures in the “Plan of Comprehensive Measures to Improve the Environmental Situation in the City of Bishkek and Sokuluk, Alamudun districts of the Chui region for 2021-2023”. Analysis of six months of PM2.5 data from Kyrgyz Hydromet’s sensor network in Bishkek suggests that the concentrations measured at sensors in the two green areas in Bishkek (one in the south and one in the north of the city) are significantly lower than the concentrations measured at the two closest sensors (located in residential areas) . Because of its potential impact of reducing air pollution and improved well-being of

residents, urban greening agenda has been prioritized by the MNRETS and the city of Bishkek.

Subcomponent 3.1 Pilot Urban Greening

30. The project will assess several options and locations for an urban greening pilot, including the locations proposed by the municipality along three rivers/canals (Alamedin, Ala-Archa rivers, Bolshoi Chui Canal BCHK) flowing through the city. The final location and type of intervention for the urban greening pilot will be determined through a consultative process, using a set of criteria to maximize positive impacts, such as local air pollution level (most importantly), access to water and irrigation system, maintenance requirement, and high accessibility to public. The potential investments may include establishing either multi-purpose green corridors containing non-motorized bike and pedestrian lanes, green public spaces, or smaller strategically placed green walls. This will be further assessed to ensure it meets pilot project objectives. Local stakeholders and residents will be engaged for ownership and enhanced sustainability, where possible, in the design and implementation of the urban greening pilot.

31. This subcomponent will also support the restoration of the Bishkek botanical garden, which exists in the middle of the city, but has significantly lost its vegetation and scientific importance. There is potential to establish a strategically designed urban forest, and a nursery that could enhance public green space while providing additional benefits such as air pollution reduction. Stakeholders emphasized the need to establish cascading greenery solutions, inclusive of grasses, shrubs, and trees, strategically placed according to site opportunities and air pollution improvement objectives. Detailed research is required to ensure that plant and tree species selection options work optimally in winter when air pollution is the strongest. Establishment of a nursery in the Botanical Garden will enable growing varieties of trees and bushes with higher emissions absorption capacity, and planting those strategically depending on the major sources of pollution. Further analysis will be carried out during the project preparation phase to ensure the roles and responsibilities for post-implementation are clear.

Subcomponent 3.2 Improve urban irrigation system

32. With the aim to expand and sustain green cover in the city, the subcomponent will support improvement of the municipal urban irrigation system, including construction/rehabilitation of at least 13 boreholes, main canals and distribution network, as well as introduction of water-saving solutions such as drip irrigation, that can ensure sufficient watering for urban greenery.

Subcomponent 3.3 Support urban planning activities on urban greening and irrigation improvement

33. The subcomponent aim to properly implement and integrate the urban greening investment into the broader city planning. This activity will provide selective support to the city government in developing a new Urban Master Plan till 2050 by providing technical assistance in developing several chapters of the strategic document, especially focused on urban greening, urban irrigation, as well as water protection zones. Specific activities will be identified in discussion with the Bishkek municipality and the State Agency of Architecture, Construction and Communal Services.

Component 4: Project Implementation Support (total: USD 2.5 million)

34. This component will support MNRETS, the Implementing agency, and project Implementation Unit (PMU) in managing the project, including monitoring and supervision, incremental operating costs for PIU staff salaries, office supplies, vehicle O&M, fiduciary, environmental and social risk management including necessary capacity building activities, greivane redress mechanisms, and other implementation costs. The detailed capacity building needs for implementation will be identified during the preparation and necessary trainings and support plans will be included in the

implementation plan and project operational manual (POM).

Climate co-benefit

35. A significant portion of the project financing is expected to have climate co-benefits. The project activities are all directed to improve air quality with climate co-benefits. All the project components will ultimately lead to adoption of technical measures to reduce PM2.5 emissions as well as GHG emissions. Supporting measures to switch from coal and adoption of energy efficiency measures in the residential buildings will directly contribute to GHG reductions. The urban greening component, by increasing the green space and number of trees can contribute to improving city's resilience while the areas increasinge in sequestration of carbon through the planted trees.

Gender

36. A time budgeting study conducted in 2015 by National Statistical Committee of the Kyrgyzstan indicates that many women and men generally conform to traditional roles. Women take greater responsibility for unpaid work whereas men spend more time in paid employment. The study found that women and adolescent girls spend 4 hours and 30 minutes per day on household chores, more than three times than men and adolescent boys (1 hour and 20 minutes). Poor availability of energy and inefficient heating systems often mean the added burden to women's unpaid care work since they may be required to search for firewood or spend time sourcing and purchasing low-cost solid fuel. In addition, women and children are more likely exposed to indoor air pollution due to prolong exposures to smoke from burning biomass or solid fuels at home. There is an increasing trend of households headed by females due to increased migration of male workers. One report indicates that the female-headed households more likely face to challenging living conditions including lack of heating and fuel . The proposed project is expected to contribute to reducing the impact of air pollution to women and children due to reduced exposure from burning of all forms of solid fuels such as coal, wood, textiles and other waste materials at home. The project design will consider how to advertise benefit programs available to female-headed and low-income household and options for providing support to them to address this gap.

Citizen Engagement

37. The project is expected to have active interaction with citizens during both design and implementation phases. Component 2 will have extensive interaction with the residential sector regarding options for cleaner and efficient heating as well as design of appropriate financial schemes to support adoption of these measures. Component 3 will also incorporate the opinions of citizens in design and implementation of the urban greening component.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

Environmental Risk is rated Moderate. Overall, the project is expected to bring positive environmental impacts by improving air quality. Project implementation risks and anticipated impacts will be typical for small to mid-scale civil works, rehabilitation, and energy improvements, therefore mostly predictable and can be readily mitigated. The potential environmental risks and impacts of the proposed activities under the project are mainly due to activities proposed under components 2 & 3. Component 2.1 would support fuel switch from coal to greener options including gas and renewable energy in selected boiler houses under the Bishkekteploenergo Municipal Enterprise, which provides heat to some of the multi-storied apartment buildings and social facilities. Currently there are 22 boiler houses that operate on coal, which

have the potential to be converted to gas and use solar technologies in a shorter-term. Component 2.2 would support investment for purchase of electric boilers, gas boilers, ground-to-air heat pumps, air-to-air heat pumps (inverter air conditioner technology), solar water heaters and include the combination of technologies best suited for multi-apartment building and individual houses that are not connected to district heating system Component 3 mainly focuses on creating urban green spaces; however, it may also involve minor rehabilitation of existing irrigation schemes including construction/rehabilitation of at least 13 boreholes, main canals and distribution network, as well as introduction of water-saving solutions such as drip irrigation, that can ensure sufficient watering for urban greenery. The nature and form of financing of schemes under components 2 & 3 will be determined during preparation.

The adverse environmental risks and impacts are related to the following: generation of dust, noise, and vibration; solid wastes, including hazardous wastes; disposal and replacement of equipment and appliances in existing boiler houses (Such as heating stoves & boilers, etc.) and installation of new ones; community safety and traffic disruption; workers? exposure to occupational risks during project implementation. These risks and impacts will be mainly short-lived, and primarily limited to the project sites (except for the movement of equipment/materials to/from the construction sites and disposal of solid waste including hazardous waste to a secure site identified by the respective authorities). The Borrower will need to prepare, disclose, consult and get the approval of the Bank on ESMF and ESCP by the end of the Appraisal. Though the Borrower's capacity is limited, the commitment of the Borrower to manage risks is high due to the criticality of the project activities for the population, and the PMO has already created a working group to start preparation of the ESF documents. However, lack of capacity may generate higher risks during project implementation. The environmental risks will be re-assessed at the project appraisal.

The social risk is rated as moderate. The Project will result in significant air quality improvements leading to major health benefits. Particularly, the project will have positive impacts at the household level, especially middle and lower middle class households who are the main users of coal and other solid fuels that largely contribute to air pollution. Thus, the project is expected to provide generally positive social benefits due to energy efficiency and the use of cleaner renewable energy. It could also generate economic opportunities for enterprises, directly and indirectly, that are involved in or affected by the project. However, one aspect that warrants attention relates to the potential socio-economic impacts of the changes in the source of energy for heating purposes. While much of the new energy could be environmentally friendly, some poorer households may find it difficult to afford such technological changes and may get excluded. Details about this are currently not known; this shall be examined in more detail during project preparation. Based on the results of such an inquiry, further decisions will be made by appraisal to ensure ?inclusion? of poorer households in the program. This may include drawing a set of criteria for selecting the dwellings for effecting technological changes.

As regards economic or physical displacement, the project investment activities are not expected to require land acquisition, restrictions on land use, or involuntary resettlement, as the energy efficiency investments, technologies and equipment are being placed in existing buildings. Similarly, greening activities will take place on pavements, road dividers, and other public spaces such as parks and other courtyards. The project is expected to engage direct workers and, possibly, contracted workers for whom Labor Management Procedures will be prepared as a part of the ESMF. Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) risks are assessed as low but will be confirmed by appraisal. Stakeholder engagement will be a key aspect of the project, given its involvement with the public facilities and residential buildings; the project will include grievance mechanisms (GMs) for labor-related issues and complaints about the project’s environmental and social management.

The project does not involve large labor influx. Specialized air quality and Energy Equipment will be installed by local workers under the supervision of technical experts. Greening in Bishkek shall be contracted to professional companies.

The project will include SEA/SH measures, including a Code of Conduct for workers, a channel in the project GRMs to report SEA/SH cases, and training and awareness sessions for project workers and affected communities.

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