Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 29-Dec-2021 | Report No: PIDISDSC33139

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Uzbekistan	P176060		Clean Energy for Buildings in Uzbekistan (P176060)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EUROPE AND CENTRAL ASIA	Mar 17, 2022	May 24, 2022	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance	Ministry of Energy, Department of Energy Efficiency, Intersectoral Energy Savings Fund	

Proposed Development Objective(s)

The development objective is to save energy in public buildings and enhance the enabling framework for clean energy investments in the buildings sector.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	143.00
Total Financing	143.00
of which IBRD/IDA	143.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	143.00
IDA Credit	143.00

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. **Uzbekistan is a resource-rich, double landlocked, and lower middle-income country that uniquely borders all other countries in Central Asia.** The country has the largest population in Central Asia of 34.8 million as of 2021, over 70 percent of whom are under the age of 40. The population is growing at about 1.9 percent per year. The Central Asia region is adjacent to some of the largest and rapidly growing economies in the world which include China, India, Russia, and Pakistan, and this presents an opportunity for Uzbekistan to become a crossroads for energy production and trade.

2. **Over the past decade, Uzbekistan has maintained high and stable economic growth rates and has gradually diversified its economy.** The officially reported average economic growth rate was over 8 percent per year during the previous decade, although it slowed down to 5.1 percent in 2018 and 5.5 percent in 2019[1]. Official poverty estimates have declined from 27.5 percent in 2001 to 11.4 percent in 2018[2]. These gains have relied largely on an economic model that is driven by the state's dominance in major productive sectors and a small, but restricted, small and medium enterprise (SME) business sector. The state's surplus was accumulated mainly through commodity exports, such as gold and cotton, sold by the state in international markets and obtained domestically at controlled (low) prices.

3. **Uzbekistan's long-term development goal is to become an industrialized upper-middle income country by 2030.** The GoU's approach toward achieving this goal is to continue the transition to a more market-oriented economy, mitigate potential negative consequences of external shocks, ensure equitable distribution of growth between regions, and maintain infrastructure and social services at an adequate level. In the medium term, the GoU's key development priorities are to: (a) further strengthen the macroeconomic stability and maintain high rates of economic growth, including the balance of the state budget and stability of the national currency; (b) increase the efficiency of infrastructure, especially of energy, transport, and irrigation; (c) enhance the competitiveness of targeted strategic sectors; (d) diversify the economy, particularly to reduce reliance on raw materials exports; and (e) improve access to and the quality and outcomes of education, health, and other social services so that the benefits of overall growth are shared equitably by the entire population. Energy plays an important role to achieve this goal, and the Government has embarked on an ambitious reform program to liberalize the sector.

[1] This is mostly attributable to: (i) lower world commodity prices, reducing the dollar value of Uzbekistan's exports and inflows of worker remittances from other commodity-dependent countries; (ii) periods of unfavorable weather that adversely affected production in agriculture, which accounts for about a fifth of the country's GDP; and (iii) a slowdown in key exports in 2018 due to energy and water shortages, unfavorable weather, and a larger-than-usual incidence of pest infestation.

[2] These figures are presented in estimated purchasing-power-parity terms. In current US dollars (Atlas method), gross national income per capita rose from US$560 in 2001 to US$2,111 in 2016, to US$1880 in 2019 due to the depreciation of the Uzbek soum

Sectoral and Institutional Context

Institutional Structure and Governance

4. **The Ministry of Energy (MoE) was established in 2019, has mandate to set and lead implementation of the national energy policy.** This includes regulating the production, transmission, distribution and consumption of electric and thermal energy, coal, as well as extraction, processing, transportation, distribution, sale and use of oil, gas, and their products. Several key ministries and committees are critical for the implementation of the energy policy. The Ministry of Investment and Foreign Trade (MIFT) oversees the investment strategy across the sector, and the Ministry of Finance (MoF) provides financing for public investments in the sector. Ministry of Economic Development and Poverty Reduction (MEDPR) supports implementation of energy policy in the industrial sector, Ministry of Housing and Construction in the buildings sector, and other line ministries (Ministry of Public Education, Ministry of Pre-schools, and Ministry of Health) support energy-related investments and policies in their respective ministries. The line ministries collaborate with the local authorities who nominate public facilities for investments. Lastly, the State Committee of the Republic of Uzbekistan for Ecology and Environmental Protection oversees environmental protection associated with energy policy and investments.

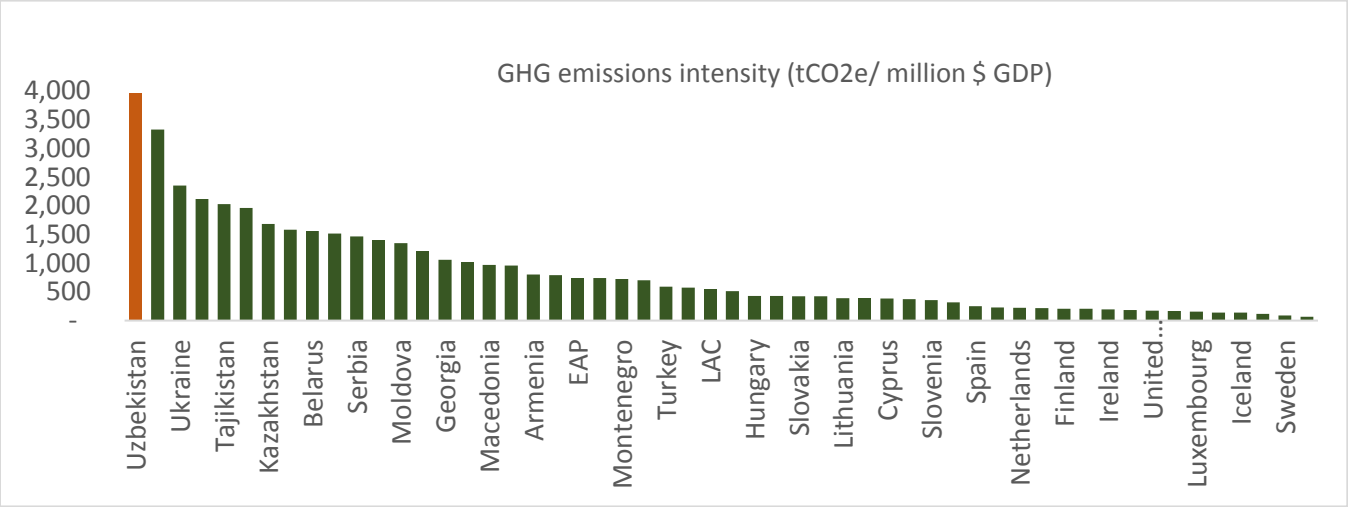
5. **The Government is implementing significant reforms which include the unbundling of SOEs in the energy sector**. The former vertically integrated national utility Uzbekenergo JSC, was unbundled into Thermal Power Plants, National Electric Networks of Uzbekistan, and Regional Electric Networks. Similarly, Uzbekneftegas was unbundled into Uzbekneftegaz, Uztransgaz, and Khududgaztaminot. This served as a first step toward introducing market-based principles and competition; recovering the electricity utilities' financial standing; transitioning toward clean energy; and strengthening regional energy connectivity and trade. The Government is also implementing large investment programs to improve the reliability of electricity supply and services to citizens and to maintain economic growth and enhance productivity. The large-scale renewable energy investments are supported by the improvements in the regulatory framework for renewable energy and public private partnership which were adopted in 2019.

6. **The energy sector still faces many challenges which include security of energy supply, inefficient consumption, and high GHG emissions:** (i) *security of energy supply* - Natural gas accounts for 86 percent of the total primary energy consumption, and more than 80 percent of the electricity mix. Most of the electricity is generated from inefficient power plants that consume about twice as much natural gas to produce electricity as a modern plant. At the current level of consumption and supply inefficiencies, proven natural gas reserves are expected to last for about 20 years; (ii) *inefficient energy consumption in dilapidated buildings* - The buildings sector is the largest energy consumer in the country though many buildings operate below comfort standards. The buildings consume comparatively more energy on a normalized basis than any other country in the Europe and Central Asia (ECA) region. Uzbekistan's energy intensity of 568 kgoe/US$1000 GDP[3] is globally among the highest, and is 3.1 times higher than the average for the ECA region. This is partly because natural gas and heat are sold at about 60 percent of supply cost, and the implicit subsidies disincentive energy efficient behavior and contribute to the lack of financial sustainability in the sector; (iii) *high GHG emissions* - At about 4,000 tCO2e/US$ million GDP, Uzbekistan's carbon intensity is about two times that of neighbouring Kazakhstan, seven times that of Turkey, and about twenty times that of a typical Western Europe country such as the United Kingdom (**Error! Reference source not found.**). Overall, 82 percent of the emissions come from natural gas, and the power sector is responsible for the highest portion (35 percent) of the emissions. The buildings sector is directly responsible for the second highest portion of 25 percent, which is largely emitted from heating using fossil fuels, and an additional 8 percent for the electricity consumed in the buildings. The industry and

[3] Value based on 2018 GDP as per World Bank, and 2018 IEA total final energy consumption of Uzbekistan

transport sectors account for 15 and 14 percent of the emissions respectively.[4] The combustion of fossil fuels also contributes to poor air quality, which can lead to respiratory diseases.

Figure 1: GHG emissions intensity of some ECA countries



7. **Investments in clean energy i.e., energy efficiency (EE) and distributed renewable energy (d-RE), in public, commercial, and residential buildings have the potential to contribute towards enhanced energy security, modernization of the buildings sector, and decarbonization of the energy sector**. Energy efficiency investments can reduce energy consumption without lowering the quality of service provided, extend life of the dwindling natural gas reserves, and result in modernized buildings after the renovations. Distributed renewable energy investments can contribute to the diversification of the energy mix. These clean energy investments contribute towards decarbonization of the economy by lowering the country's GHG and local pollutant emissions. The several benefits of decarbonization include: (i) mitigating climate change; (ii) improving economic and industrial competitiveness by reducing energy costs per unit output; (iii) improving air quality; and (iv) creating jobs. The investments also have an impact on climate adaptation efforts by making buildings more climate resilient through reducing their energy demand and providing an ability to supply their own energy. Both energy efficiency and distributed renewable energy are further discussed in the context of the buildings sector below.

Energy efficiency in the buildings sector

8. **The buildings sector is responsible for a significant amount of energy consumption, most of which is for space heating**. The sector accounts for 60 percent of the final natural gas consumption, 56 percent of the final coal consumption, and 34 percent of the final electricity consumption. Overall, the buildings sector accounts for 50 percent

of the total final energy consumption, followed by the industry and transport sectors at 22 percent and 20 percent respectively. In the public building sector, heating is responsible for about 70 percent[5] of the energy consumption in regional hospitals, 84 percent[6] in pre-schools, 88 percent[7] in rural clinics, and 97 percent[8] in public schools. In the residential sector, heating is responsible for about 67 percent of the final energy consumption.

9. **Most of the space heating in buildings is generated from individual gas boilers.** There are 21,340 public buildings, 135,255 commercial buildings, and 3,957,485 residential buildings in Uzbekistan.[9] 10 percent of the buildings use centralized district heating, and 90 percent use heat generated from individual boilers. Centralized district heating has largely been neglected around the country, and 70 percent of the remaining district heating systems are in Tashkent. The district heating sector generates most of its heat from natural gas, relies on old Soviet-era boilers, faces financial viability challenges due to low tariffs set below cost-recovery, and lacks consumer trust to provide good quality services.[10] The use of individual boilers is largely split between gas and coal boilers. Biomass (or other renewable options) are not widely represented in the market. 63 percent of the regional hospitals use individual *gas* boilers for heating,[11] and about 70 percent of the rest of public buildings use individual *coal* boilers.[12] 70 percent of the residential homes and commercial buildings use individual natural gas boilers for heating. 75 percent of the boilers are inefficient and have been in service for 10 years or more. About 35 percent of the boilers are 'homemade' by local craftsman using non-standard components and without proper safety compliance. These nonstandard boilers consume almost 50 percent more gas than boilers manufactured according to modern industrial standards.

10. **The buildings are generally in poor condition, operate below comfort standards, and have high energy intensity.** Most of the public, commercial, and residential buildings were developed in the 1970s-80s with little regard to energy efficiency. About 85 percent of the 53 million square meters of public buildings is in healthcare and education sectors. The facilities are poorly insulated, largely underheated, and use old (at least 10 years old) boilers and water heating systems. 20 percent of the respondents of a survey conducted in 2015 reported dissatisfaction with thermal comfort conditions in the facilities, and indoor temperatures during winter months averaged below the 20 degrees Celsius stipulated in the building code.[13] Similarly, most commercial buildings (shops, hotels, restaurants etc) are underheated, lack insulated roofs and walls, and most use old inefficient heating technologies. Residential buildings are often underheated, have inadequate insulation of windows, roofs, and walls, and face heat and electricity supply disruptions during the winter. There were several protests (in Khorezm, Navoi, Bukhara, Kashkadarya, Syrdarya, and Andijon provinces in January 2021; in Andijon, Namangan, and Ferghana provinces in November 2020; and in Bukhara Andijon, and Syrhandarya provinces in December 2020)[14] during the 2020-2021 winter season over the shortage of gas (for heating) and electricity supply to homes. Despite the underheating, the associated average specific heat consumption in the public buildings is high at 253kWh/m^2 - ranging from 204-450 kWh/m^2 depending on the specific type of building. The specific heat consumption in residential buildings is 290 kWh/m^2, which is also high compared

[5] World Bank, 2021. Of the remainder, 8 percent is for lighting, 7 percent for water heating, 7 percent cooking, and 8 percent for other.
[6] World Bank, 2021. Of the remainder, 6 percent is for water heating, 3 percent for refrigeration,3 percent of lighting, and 2 percent for cooking, and 2 percent for air conditioning and office equipment.
[7] World Bank, 2021. Of the remainder, 4 percent is for lighting, 3 percent air conditioning, 2 water pumping, and 3 percent for other.
[8] World Bank, 2021. Of the remainder, 2 percent is for lighting, and 1 percent for equipment
[9] World Bank 2016. Republic of Uzbekistan: Scaling up Energy Efficiency in Buildings. © World Bank.
[10]The District Heating Energy Efficiency Project (P146206) is financing renovations of the district heating system in Andijan City, Bukhara City, Chirchik City, Samakand City, and Sergeli District.
[11] 24 percent of the regional hospital are heated using coal
[12] Gas is used for heating 38 percent of preschools, 23 percent of rural clinics, and 23 percent in schools
[13] World Bank 2016. Republic of Uzbekistan: Scaling up Energy Efficiency in Buildings. © World Bank.
[14] The protests were tracked by https://oxussociety.org/viz/protest-tracker/

to the 95 kWh/m^2 in the Netherlands which is similarly dependent on natural gas and reliant on individual gas boilers, and would be even higher if the buildings consistently met the 20° C norms.

11. **There is significant, cost-effective energy saving potential across the public buildings sector.** Demonstration pilots by the United Nations Development Program (UNDP), supported by the Global Environment Facility, found that cost-effective normative energy savings potential in schools and hospitals ranged from 35-45 percent.[15] The renovations implemented as part of the demonstrations by the UNDP included: insulation of walls, floors, roofs and basements; use of double glazed windows; replacement of heating pipes, radiators, and boilers; replacement of doors; heat reflectors; automatic thermo controls; shading; and improved ventilation. The pilots found the potential to reduce energy consumption by 22 percent while bringing public buildings into compliance with the requirements of building code 2.01.18-2018. A 2021 World Bank study similarly found that: (i) the annual energy savings potential in pre-school, public school and health care facilities is 7,051 GWh (thermal: 6,809.1 GWh, electricity: 241.9 GWh); and (ii) implementation of EE measures is viable in public buildings since financial IRRs meet the cost of capital.[16] The potential is similarly high in the commercial sector, and estimates in the residential sector range from 20-50 percent depending on the type of EE investments implemented.[17] A 2016 World Bank study found that replacing highly inefficient nonstandard gas boilers with modern gas boilers would reduce residential and commercial gas consumption by about 2.4 billion m^3 or about 13 percent of the total residential and commercial gas consumption, with a payback period less than 8 years[18] and the payback period would be under 5 years if the energy tariffs were fully cost reflective.

12. **The Government is keen to realize the economically viable energy efficiency potential.** It signed the Paris Agreement on Climate Change in April 2017 and ratified it in September 2018. Its intended nationally determined contributions (INDCs) set a mitigation objective to decrease carbon intensity by 10 percent by 2030 from 2010 levels, and the government also adopted policy to improve overall energy efficiency by 50 percent by 2030 (with 2015 as the baseline line year). The Law on Rational Use of Energy No. 412-I (1997, as amended on 14 July 2020) forms the legal basis for energy efficiency programs. In addition, the GoU issued several programmatic decrees and resolutions such as Presidential Decree No. PP-2343 of 2015,[19] Presidential Decree No. PP–3102 of 2017,[20] Presidential Resolution No. PP-4422 of 2019,[21] and Presidential Decree PP-4779 of July 2020. The decrees incentivize the use of clean energy. For example, Presidential Decree No. PP-4422 (2019) provides guidance for financial support, standards development, awareness programs, and capacity building for the development of clean energy.

Distributed renewable energy

[15] UNDP (United Nations Development Programme). 2014. Energy Efficiency in Buildings: Untapped Reserves for Uzbekistan Sustainable Development Summary Report. Tashkent: https://www.uz.undp.org/content/uzbekistan/en/home/library/environment_energy/energy-efficiency-in-buildings--untapped-reserves-for-uzbekistan.html

[16] World Bank. 2021. Deploying Energy Efficiency and Distributed Solar in the Public Buildings. © World Bank.

[17] ibid

[18] World Bank 2016. Republic of Uzbekistan: Scaling up Energy Efficiency in Buildings. © World Bank.

[19] Presidential Decree No. PP-2343: Program of Measures to Increase Energy Efficiency and Introduce Energy-Saving Technologies in the Sectors of Economy and Social Sphere during 2015–2019

[20] Presidential Decree No. PP – 3102 of 26 May 2017: the programme of measures for furthering the development of renewable energy and enhancing energy efficiency in 2017–2021

[21] Presidential Resolution No. PP-4422: About Accelerated Measures to improve energy efficiency of economic and social spheres, Introduction of energy-saving technologies and development of renewable energy sources

13. **Uzbekistan is endowed with significant renewable energy resources which are not yet fully utilized**. About 5 percent of the current renewable energy potential is being utilized in the form of large hydro power plants.[22] The estimated technical potential of renewables for power generation (3,494 TWh) is significantly higher than the current demand for electricity (61.2 TWh). Usage of renewable resources for space and water heating purposes is negligible; hence there is no substantial market for biomass heating, solar water heating, or geothermal heat pumps, etc.

14. **The Government has developed a successful approach to the development of *large-scale* renewable energy projects.** It enacted the Law on Public–Private Partnership (PPP) in 2019 to support and protect private investors in large infrastructure projects. The first large-scale solar project in the country, 100 MW Navoi Solar independent power producer (IPP) project, was developed under the World Bank Group Scaling Solar Program and yielded a competitive power purchase agreement (PPA) tariff of US¢2.679/kWh. Building on the success of the first solar IPP project, the GoU entered into agreements with the World Bank Group to support preparation of additional 900 MW solar and 1,300 MW gas-fired IPPs, as well as with Asian Development Bank (ADB) and European Bank for Reconstruction and Development (EBRD) on preparation of 1,000 MW solar IPPs and 1000 MW wind IPPs, respectively. The 220MW solar auction in Samarkand yielded a tariff of USc1.791ckWh, and that in Jizzakh of USc1.823/kWh, further demonstrating the success of the government's approach to developing large-scale solar.

15. **There is need for *distributed renewable energy* to improve energy supply reliability where the grid is fragile, and support the transition from coal to renewable heating.** Uzbekistan has more than 250,000 km of electricity transmission and distribution lines, and most of the grid networks were built during the Soviet era and have become obsolete and past their economic life. On average, transmission and distribution assets are approximately 35 years old. Both frequency and duration of electricity outages are high by the region's standards. According to the World Bank's 'Growth Diagnostics for Uzbekistan Study', large and small manufacturing firms experienced around 24–29 days of electricity blackouts in 2017/2018. As a result, a large amount of production output, estimated at 24 percent among large firms and 38 percent among small firms, is lost due to interruptions in infrastructure services, including electricity, gas, and water. Renewable energy such as rooftop solar PV, biomass, and combined solar heat pumps can be used to replace coal heating. Preliminary walk-through energy audits indicate that 22-30 percent of coal boilers in rural schools and pre-school can be replaced with clean forms of heating.

16. **The affordability of distributed renewable energy is improving.** The development of distributed renewable energy or distributed solar PV in particular can be affordable and reliable. In the last five years, the cost of rooftop solar PV has fallen by 45 percent in California, and 66 percent in Germany cities due to improvements in technology, advances in manufacturing, and economies of scale.[23] Overall solar module prices have fallen by 80 percent over the last seven years. [24] However, a World Bank study conducted during 2018-19 showed that rooftop solar PV investments were not financially viable if implemented separate from EE investments. The combination of rooftop solar PV and EE had a payback period of 10.5 years (versus 9 years for EE investments), and could be a viable option where it's needed to improve resilience by serving as back-up generation and/or where prosumers are compensated for exporting excess generation to the grid. The cost of local services for distributed solar PV in Uzbekistan is expected to fall further with the implementation of large-scale solar PV projects as supply chains are established, local labour share is increased, and demand for such services improves with more awareness.

17. **The Government is keen to utilize more distributed renewable energy.** The Law on the Utilization of Renewable Energy Sources No. ZRU-539 (2019) forms a common legal basis for renewable energy programming. The GoU set a

[22] World Bank. PAD: Uzbekistan – Navoi Scaling Solar Independent Power Producer Project

[24] World Bank 2017, Exploiting Synergies between Rooftop Solar PV, and Energy Efficiency Investments in the Built Environment

target to raise the share of renewable energy generation to 25 percent by 2030 from the current 10 percent, and Presidential Decree No. PP-4422 (2019) specifically sets a target to increase the overall solar power capacity to 4,300 MW by 2030. The decree also grants tax privileges to renewable energy producers and power generation equipment manufacturers. Moreover, Cabinet of Minister's Resolution 217 (April 2021) provides guidelines for the provision of 30 percent capital grants for rooftop solar PV systems, and the Government is developing a compensation scheme for small scale prosumers who export excess generation to the grid. In sum, these developments will likely improve the viability of rooftop solar PV investments going forward.

Barriers to effective implementation of clean energy investments

18. ***Low tariffs and high cost of capital*. Clean energy investments are generally disincentivised by the low gas, heating, and electricity tariffs; and the high cost of investment capital**. The weighted average gas tariff (for heating) of 380 soums/m3 (US$0.036/m3) is around 60 percent of its supply cost. The weighted average heating tariff of 125,280 soums/Gcal (US$11.87/Gcal) is similarly below cost at 60 percent of its supply cost, and the weighted average electricity tariff of US$0.043/kWh is relatively higher but at 80 percent of its supply cost. Thus, some stakeholders have limited incentives to explore clean energy investments as the financial benefits are low. Additionally, the Uzbek Soum-denominated investment interest rates range from 22-24 percent; hence are cost prohibitive when considered over the payback period of typical clean energy investments of 9-11 years. The typical loan tenor of 1-2-years is also much shorter than the typical investment payback period.

19. ***Borrowing constraints.* Public facilities in Uzbekistan cannot borrow due to legal restrictions, lack of collateral, and limited creditworthiness.** According to Uzbekistan budget law, public facilities are not allowed to borrow, and since the Government has limited resources, there is constrained financing for clean energy investments in the public buildings sector. If the facilities were authorized to borrow, they would likely face other constraints because they lack collateral, have neither borrowing history nor track record of repayments with commercial banks, and are largely reliant on central government transfers; thus, are unlikely to be deemed creditworthy. Moreover, loan collateral requirements are high as they range from 125 to 175 percent of the loan, and banks are uncertain about the enforceability of collateral claims for Clean energy investments in the public buildings sector. Investments could be funded using budget provisions or grants, but these are limited and unsustainable.

20. ***Institutional and regulatory barriers.* There are significant institutional and regulatory barriers for public building administrators to carry out clean energy investments.** These include a lack of funding to cover upfront development costs such as energy audits and feasibility studies, lack of proper net metering and grid connection rules for rooftop solar PV, inability to retain budget cost savings, public procurement which favors lowest costs over best value, and poor enforcement of existing technical standards and codes. While the Ministry of Energy can develop regulations, there is need for an entity to finance and implement investments, and provide experience-based feedback to improve Government policies and regulations. The GoU legally established the Intersectoral Energy Savings Fund (the Fund) in July 2020 through Presidential Decree No. PP-4779 and Cabinet of Ministers Resolution No. 640 of October 2020 to finance and implement clean energy investments. Since the Fund is new, there is need for institutional strengthening for the Fund to have transformational impact on EE in the country.

21. ***Capacity barriers.* There is limited capacity among banks, government entities, and private companies to implement clean energy investments at scale**. Banks have limited experience assessing risks and benefits of clean energy investments in the buildings sector, government entities have limited capacity to design, procure, operate, and maintain the investments, and only a few private companies have capacity to implement the investments. Of the five banks consulted during Project identification, only one had clean energy buildings subprojects experiences to share. Past Government programs have yielded limited results and the incentives were difficult to sustain and scale up. Line ministries have design and construction companies that focus on major reconstruction projects; hence have limited

capacity to design and implement clean energy investments. Small and medium sized engineering firms, which have the potential to become ESCOs, struggle to convince banks to fund their business plans beyond equipment purchases with limited 1–2-year tenor.

22. ***Lack of awareness and information barriers*. The lack of awareness and information about clean energy inhibits broad interest to develop the market.** The public has limited awareness of the benefits and needs for clean investments; hence there is limited broad uptake of the programs. There is also lack of information/data (needed to start to develop clean energy programs such as: building statistics and typologies, typical energy consumption, high and low public building performers, a variety of credible case studies on costs and benefits, information centres, and database of service providers, EE technologies and/or equipment providers. Overall, many stakeholders are not aware of the opportunities to improve clean utilization; hence lack full commitment.

Proposed Project

23. **The proposed Project will help address some of these prevailing clean energy investments barriers.** It will build on the ongoing *Support for Preparation of Energy Sector Strategy Programmatic ASA (Strategy PASA*, launched in FY19 and funded by ESMAP) which is broadly supporting energy sector institutional and market development, subsidy reform, renewable energy development, clean energy transition, and private sector participation in the sector's development. More specifically, the proposed Project will finance clean energy investments in the public sector in a way that develops an enabling framework for more sustainable and scalable financing of clean energy investments in the sector.

24. **The proposed project will demonstrate a sustainable and national market for clean energy investments in the buildings sector**. The benefits demonstrate the viability of a market for clean energy investments which is the bedrock for private sector participation. This viability in the public sector can be translated into the commercial and residential markets where the heat and electric tariffs are higher; hence the financial benefits from the investments are higher. Private sector participation is needed to sustain the investments because government resources are limited. The sustainable market will also develop market demand for clean energy equipment and services which will help to develop an industrial/manufacturing base.

25. **The proposed project will showcase co-benefits of clean energy investments such as improved comfort conditions, viability of switching to renewable heating, and environmental benefits**. The buildings will be renovated to national comfort standards to avoid under-or overheating, ventilation improved, and facilities modernized. Preliminary studies indicate that about 20-30 percent of facilities audited by the Ministry of Energy can switch from coal to renewable heating which will lead to improved air quality in schools and hospitals, and reduce respiratory health challenges associated with local air pollution.

26. **The proposed project will also help to develop local clean energy investment capacity and raise awareness.** The project will broadly improve experiential capacity of energy auditors, designers and construction companies who will hired under the project. These stakeholders will be able to provide their services to the commercial and residential sectors as well. Successful case studies, public campaigns, market development activities will all contribute to raise awareness about clean energy investments.

Choice of instrument

27. **The proposed Project will use the IPF with performance-based conditions (PBCs) instrument.** This instrument enables the Bank to provide closer supervision and implementation support which is needed to implement energy services agreements that have never been implemented in the country before. There are significant challenges to the

development of a comprehensive enabling framework for clean energy investments in the buildings sector; hence linking some disbursements to critical actions (the PBCs) necessary to improve the enabling framework enhances the likelihood of having the critical actions *adopted* by the Government. The team considered using an IPF instrument as well, but the instrument lacks mechanisms to encourage the Government to adopt significant policy measures.

28. **An alternated instrument formulation could be a Program for Results (PforR).** Advice from OPCS, fiduciary and safeguards specialists, Ministry of Finance, Ministry of Energy, Ministry of Investment and Foreign Trade, and Ministry of Public Education was considered, and the team concluded that the PforR instrument would likely not achieve the desired development objectives in a timely manner for the following reasons:
    a. *Nascent national systems:* Institutions, procurement systems, financial management systems, and other framework conditions necessary for *large-scale and sustainable* clean energy programs are still nascent in Uzbekistan. While legislation broadly allows the use of advanced approaches to Project implementation such as performance-based contracting, lifecycle costing, energy service agreements etc., the institutions lack capacity to implementing these novel approaches. Thus, there is need for close supervision and implementation support to successfully implement the Project utilizing approaches that enhance scalability and sustainability of the investments in the long run.
    b. *Absence of a Government national program:* A PforR program is typically anchored in a national program. The GoU has just launched the *development* of such a program to be completed in July 2022; thus, there is no current national program in which a PforR program could be anchored. This makes it difficult to prepare the PforR (e.g., conduct fiduciary, technical, environmental, and social assessments; and conduct economic and financial analysis for the PforR which is typically done at the program level.)
    c. *Lack of Government procedures for processing a PforR:* Uzbekistan does not have Government procedures for processing PforRs; hence using the PforR instrument would significantly delay the Project preparation and approval by the Government.
    d. *Ability to elevate Project ambition using PBCs:* The previous PCN meeting recommended to elevate ambition of the Project, and the same can be achieved through PBCs (similar to DLIs) to advance critical clean energy reforms in the buildings sector. PBCs allow disbursements linked to achieving results, and will be used to incentive adoption of key elements of the comprehensive enabling framework for clean energy investments in the Project.

29. **In the rebuilding better effort, the proposed IPF with PBCs builds on the World Bank energy program** by charting a new direction for World Bank activities in support of the energy sector reforms, scale-up of private investment and commercial financing, diversification of power mix from domestic resources (through distributed solar), and broader decarbonization of the economy. This complements the ongoing activities such as Navoi Scaling Solar Independent Power Producer Project (P170598), Energy Efficiency Facility for Industrial Enterprises Project (P118737), and District Heating Energy Efficiency Project for Uzbekistan (P146206).

Relationship to CPF

30. The proposed Project is consistent with the Country Partnership Framework (CPF) for Uzbekistan (FY2016-20) as adjusted through FY18 Performance and Learning Review (PLR. The PLR identifies key priorities for WBG engagement in the energy sector as (a) SOE reforms, (b) energy sector strategy development, (c) scaling up of energy efficiency and clean energy development, and (d) strengthening regional energy trade and market development. The proposed Project will most directly contribute to "(c) scaling up of clean energy development and energy efficiency." It will contribute to

the PLR's following objectives: (a) Objective 1.1. Enhanced economic growth and transition toward a market economy; (b) Objective 1.5. Improved efficiency of infrastructure service delivery, including through PPPs, and (c) Objective 2.2. Increased access, efficiency and reliability of power supply and heating services.

31. The WBG's engagement in Uzbekistan has been adjusted in line with the WBG COVID-19 Crisis Response Approach Paper, "Saving Lives, Scaling-up Impact and Getting Back on Track". The Project will directly contribute to the "strengthening policies, institutions, and investment for resilient, inclusive and sustainable recovery" pillar. It will contribute by creating jobs (IEA studies showed that EE investments create the most jobs when compared to other energy infrastructure investments), facilitating private sector participation, and making social facilities more resilient to future shocks. In pre-schools and schools, the Project will specifically improve ventilation to minimize the spread of the corona virus, provide digital infrastructure for enhanced remote learning, and improve comfort conditions which has been shown to improve learning outcomes. Similarly, in hospitals and clinics, the proposed Project will improve comfort conditions which improves health outcomes. Lastly the proposed Project is well-balanced between supporting the emergency response and strengthening the economy's post-COVID recovery as it is designed to immediately support investments and be sustainable in the long term.

32. The proposed Project will also contribute towards the Bank's twin goals (reducing poverty and boosting shared prosperity), and towards Maximizing Finance for Development (MFD). The Project will design a mechanism to distribute capital grants for energy efficient equipment in the residential sector, thereby reduce poverty by facilitating access to the grants. It will boost shared prosperity by supporting improvements in schools and hospitals in all regions of the country. Lastly it will support the MFD objective of enabling private sector participation in the energy sector development by using the risk sharing facility to attract private sector participation.

33. Lastly, the proposed Project will contribute to the WB Climate Action Plan commitment to increase climate financing to 35 percent of total financing. Clean energy investments reduce GHG emissions thereby contribute to climate change mitigation. The investments also strengthen climate change adaptation by improving the ability of building facilities to supply own power through rooftop solar investments and utilize less energy, and is aligned with the Paris Agreement as part of the World Bank's goal to be 100 percent aligned by 2023.

C. Proposed Development Objective(s)

The development objective is to save energy in public buildings and enhance the enabling framework for clean energy investments in the buildings sector.

Key Results (From PCN)

30. Progress towards the development objective will be monitored using the following indicators:
    a. (Core indicator) Projected lifetime energy savings (MWh) from energy efficiency investments in public buildings,
    b. Successful implementation of the revolving financing mechanism as evidenced by energy cost savings paid to the Fund by beneficiary facilities (Uzbek soum), and
    c. Adopted national program for enabling clean energy investments in the buildings sector (text). This indicator is a PBC as well.

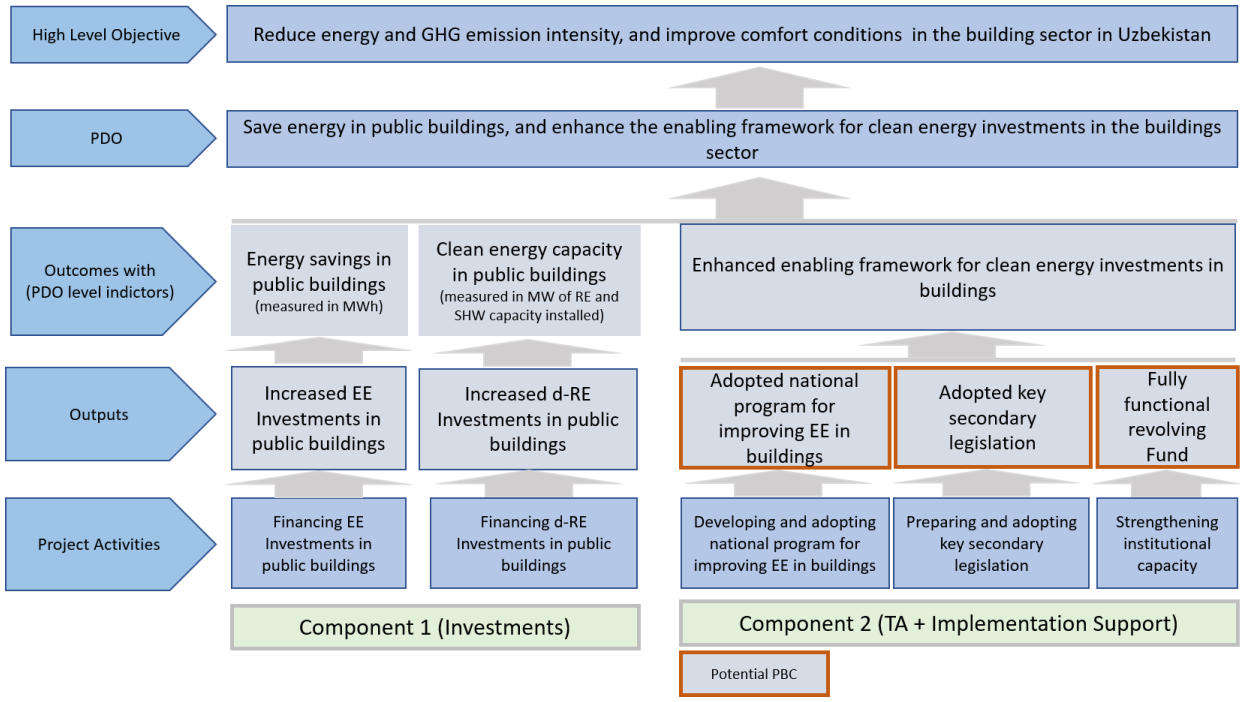
31. Intermediate results indicators will be developed as Project preparation progresses, and will include renewable energy capacity added (MW), GHG emissions reduction (tCO2eq), and clean energy secondary legislation adopted under the project (this intermediate indicator is a PBC as well).

D. Concept Description

Description

The preliminary theory of change is summarized in *Figure 2*. Project activities such as 'financing energy efficiency investments in public buildings' lead to outcomes such as 'energy saved in the beneficiary buildings.' The outcomes contribute to the PDO which in turn contributes to the high-level objective to 'reduce energy and GHG emissions intensity, and improve comfort conditions in buildings.'

Figure 2: Preliminary theory of change



The Project has two components: (1) clean energy investments in public buildings; and (2) technical assistance to enhance the enabling environment for the investments, and project implementation support. These components are further discussed below:

Component 1: Clean energy investments in public buildings (US$123million - US$138 million)[25]: This component will support energy efficiency and distributed renewable energy investments in select priority pre-school, public education, and health sector facilities under the Ministry of Pre-school Education (MoPSE), Ministry of Public Education (MoPE), and Ministry of Health (MoH) respectively. Investments in the selected facilities will be implemented using energy service agreements between the Fund and the public entity (local school, pre-school, or hospital). Under such an agreement, the Fund will provide full set of services for clean energy improvements at the facility, and the entity will pay for such services during the payback period of the investments using energy cost savings. The services provided by the Fund will include energy audit, design of EE measures, procurement, and financing of works as well as measurement and verification of savings. Typical EE measures will include insulation and improvement of building envelopes, HVAC and lighting systems, replacement of coal boilers with renewable energy options such as integrated solar PV with heat pumps and/or solar collectors where feasible. The Net Zero Energy Building (NZEB) approach will be piloted where feasible, with the help of a grant provided by the Energy Sector

[25] US$123million will be available after effectiveness, and an additional US$15 million after achieving performance-based conditions i.e. as disbursements linked to achieving agreed policy results.

Management Assistance Program (ESMAP). MoPSE, MoPE and MoH facilities account for the largest number of public buildings in Uzbekistan. Eligible facilities will include kindergartens; day-care facilities; public primary, secondary, and high schools; dormitories; student hostels; specialized schools (e.g., sports and cultural schools); central, regional, and municipal hospitals; rural clinics; and associated administrative buildings. All buildings would need to meet the following criteria: (i) central public ownership; (ii) not had a full EE renovation in the past 10 years; (iii) structurally and seismically safe; (iv) have no plans for office moves, closure, building demolition or selling. The buildings would need to achieve at least 20 percent energy savings after renovation and have a maximum simple payback period of 12 years.[26] All buildings will be centrally owned, and payments done through treasury.

Component 1 will also support technical services directly related to investments including: (i) subproject screening, detailed energy audits, technical designs, construction supervision, and technical and social monitoring before and after the EE investments; (ii) online monitoring system for energy performance to help implement the measurement and verification framework, and manage energy consumption post renovation; and (iii) environmental and social management plans as per the Environmental and Social Framework.

Component 2: Enhancing the enabling environment for clean energy investments, and project implementation support (US$5 million). This component will provide technical assistance to enhance the enabling environment for clean energy investments in the building sector, and project implementation support. The component is divided into four subcomponents, the first three of are instrumental to the enabling environment (see Figure 2), and the fourth is dedicated to project implementation support:

a. *Subcomponent 2a. National Building Energy Efficiency Program* – The national program to improve energy efficiency investments in the buildings sector is instrumental to scale-up clean energy investments in the sector. Development of the program is ongoing during preparation, and technical assistance during implementation will support the launch of the program;

b. *Subcomponent 2b. Secondary legislation* – This subcomponent will support the development of key secondary legislation according to international best practices and local requirements, conduct stakeholder workshops to solicit feedback on the draft legislation, and support the submission of the secondary legislation for cabinet approval;

c. *Subcomponent 2c. Institutional strengthening and capacity building* - This subcomponent will support the full operationalization of the Fund to use revolving financing mechanism for implementing clean energy investments, and provide capacity building to other key stakeholders. It will support activities to improve capacity in revolving financing, project management, staffing, procurement, audit/designs, financial management systems, and environmental and social safeguards management. The subcomponent will also support activities such as south-to-south knowledge exchange, training, twinning, and workshops (targeting local and central government authorities, design and construction companies, banks etc.), and support communication and public outreach activities to enhance clean energy awareness;

d. *Sub-component 2b. Project implementation support* - This subcomponent will support activities of the Fund related to implementation of the proposed Project. Although Presidential Decree No. 4779, stipulates that the Government will provide financing for Fund operations, the subcomponent will provide equipment,

[26] The average payback period of the investments under the World Bank Deploying Energy Efficiency and Distributed Solar in the Public Buildings TA is 10 years.

logistics, and key project consultant salaries (Project Manager, Engineer, Financial Manager, Procurement Specialist, Environmental and Social assessment consultants, and others.)[27]

Preliminary Performance-based Conditions (US$15 million)

The PBCs will collectively ensure that the Project is able to scale-up clean energy investments in a sustainable manner. The PBCs strengthen the Project's orientation towards achieving key policy results which do not require significant financial investment but require significant effort to achieve. For example, the preparation of secondary legislation is often inexpensive, but getting the legislation approved and adopted is often challenging.

1) ***PBC 1 - Adoption of a national program to scale-up clean energy investments in the buildings sector (US$5 million)*** – An adopted national program is a key output and PBC as shown in the preliminary theory of change. The Government has broad clean energy decrees which cover diverse topics such as fuel switching in agricultural equipment, production of synthetic fuels, improved oil production, gas flaring, renovation of distribution networks, hydrogen development, etc. which have had limited impact on the buildings sector. International best practices e.g., from Energy Community and European member states, show that a national program can help the Government to:
   i. align stakeholders involved in the buildings sector;
   ii. centralize understanding and characterization of the building stock including economic/financial appraisal of the clean energy investments, and quantification of energy and non-energy benefits;
   iii. comprehensively appraise barriers and develop a holistic policy package to enable the investments; and
   iv. develop buildings sector clean energy improvement targets, and pathways to achieve the targets.

   The Bank is supporting the Government to develop the comprehensive national program which will layout policy, strategy, and objectives in the sector, specify clean energy targets; develop pathways to meet the targets; and mobilize investments. The program will bring national focus to the building sector; high-level national objectives (such as to decrease carbon intensity by 10 percent by 2030 from 2010 levels; improve overall energy efficiency by 50 percent by 2030; and raise the share of renewable energy generation to 25 percent by 2030) will be transposed to the sector, and targets further detailed over an agreed period. Funds linked to this PBC1 will be disbursed when the Government issues a decree adopting the comprehensive national program. The funds can be used for program activities or investments as outlined in Component 1.

2) ***PBC 2 - Adoption of key secondary legislation (US$5million)*** – Despite the issuance of legislation supporting clean energy investments, key secondary legislation has not been developed yet. Regulatory assessments indicate that there is need for: (i) secondary legislation and standards for energy audits and building energy performance; and (ii) secondary legislation to facilitate commercial financing for clean energy investments in the buildings sector. This PBC will support the adoption of the key secondary legislation which is a key output as shown in the preliminary theory of change in *Figure 2*.

3) ***PBC 3 – The Fund is fully functional and revolving with adequate staff and budget (US$5million)*** – Disbursements under this component will be linked to the Fund fully functioning utilizing a revolving financing mechanism, and completion of institutional strengthening and capacity building activities for key stakeholders such as the Ministry of Energy, line ministries, and local governments in charge of beneficiary facilities. The specific measurable

[27] The estimated cost of this component will be reviewed based on findings of the Project Procurement Strategy Document (PPSD)

activities linked to PBC3 will be defined during preparation, and will likely include number of appropriate Fund staff and budget allocation as per legislation, and number and types of capacity building and awareness activities.

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

The environmental and social risk ratings are Moderate. The project will support Energy efficiency and distributed renewable energy investments in public buildings. It could also finance new technologies such as integrated solar PV with heat pumps for heating, and solar collectors for hot water heating, and replacement of coal-based heating with clean solutions. Overall, the environmental impacts from the project are expected to be positive given that the energy consumption will be reduced. Furthermore, the energy efficiency will lower greenhouse gas (GHG) emissions and other pollutants, as well as decrease water use. However, some activities may entail potential adverse environmental impacts such as dust and noise generation, vehicle and machines emissions, generation of construction waste including oil, grease, hydrocarbons, old electrical appliances, lead-based paints, etc. However, the impacts related to the project are expected to be temporary, reversible and easily manageable through the application of the national laws as well as the use of the World Bank Environmental, Health and Safety Guidelines (EHSGs) and Good International Industrial Practices (GIIP).

The project is expected to provide generally positive social benefits due to energy efficiency and use of cleaner renewable energy. It could also generate economic opportunities for enterprises directly and indirectly involved in or affected by the project. The project investment activities are not expected to require land acquisition, restrictions on land use or involuntary resettlement, as the EE and d-RE investments, technologies and equipment are being placed in existing schools and hospitals and are not expected to cause economic and physical displacement. However, the project will review and confirm this by appraisal. The project is expected to engage direct workers and, possibly, contracted workers for which 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. Much of the project is focused on TA and the development of systems for commercial financing; the EE and d-RE equipment will be installed by local professionals from the community. Stakeholder engagement will be a key aspect of the project, given its involvement with schools and hospitals; the project will include GRMs for labor-related issues and for complaints about the project?s environmental and social management.

CONTACT POINT

World Bank

Pedzisayi Makumbe, Yun Wu
Senior Energy Specialist

Borrower/Client/Recipient

Ministry of Finance
Jasur Karshibaev
Head of Foreign Debt Department
info@mf.uz

Implementing Agencies

Ministry of Energy, Department of Energy Efficiency
Muzaffar Hakimov
Head of Department of Energy Efficiency
xakimov.m@minenergy.uz

Intersectoral Energy Savings Fund
Akhadjon Ochilov
Executive Director
ochilov.a@minenergy.uz

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: http://www.worldbank.org/projects

APPROVAL

Task Team Leader(s):	Pedzisayi Makumbe, Yun Wu

Approved By

Country Director:	Sascha Djumena	30-Dec-2022