ASIAN INFRASTRUCTURE INVESTMENT BANK

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Project Document
of the Asian Infrastructure Investment Bank
Sovereign-Backed Financing

Republic of Türkiye
P000705 Istanbul Seismic Mitigation and Emergency Preparedness (ISMEP)
Additional Financing Project
(Final Stage)

Currency Equivalents
(As at date June 14, 2023)

Currency Unit – Turkish Lira
TRY 1.00 = EUR 0.039
EUR 1.00 = USD 1.086

Borrower's Fiscal Year
January 1 – December 31

Abbreviations

AIIB	Asian Infrastructure Investment Bank
DA	Designated Account
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ENPV	Economic Net Present Value
ES	Environmental and Social
ESP	Environmental and Social Policy
ESS	Environment and Social Standards
EUR	Euro
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
IFI	International Finance Institution
IPCU	Istanbul Project Coordination Unit
ISMEP	Istanbul Seismic Mitigation and Emergency Preparedness
ISMEP-AF	ISMEP Additional Financing
KfW	KfW Development Bank
MDB	Multilateral Development Bank
NCT	National Competitive Tendering
NDC	Nationally Determined Contribution
PP	Procurement Plan
PPM	Project-affected Peoples Mechanism
SDR	Social Discount Rate
USD	US Dollar

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1. Summary Sheet

Project No.	P000705
Project Name	Istanbul Seismic Mitigation and Emergency Preparedness Additional Financing Project
AIIB Member	Republic of Türkiye
Borrower	Republic of Türkiye
Project Implementation Agency	Istanbul Project Coordination Unit (IPCU)
Sector Subsector	Urban Urban Resilience
Alignment with AIIB's thematic priorities	Green infrastructure
Project Objective	The objectives of the Project are to improve the disaster resilience of critical public facilities built before 1999 and to further enhance emergency preparedness and resilience of the City of Istanbul. These objectives are similar to AIIB's ongoing financed Istanbul Seismic Mitigation and Emergency Preparedness (ISMEP) Project approved in 2019.
Project Description	Building on the highly successful ISMEP Program initiated and implemented by the World Bank from 2005-2015, the ISMEP Program has since received support from many International Finance Institutions (IFIs), including the ongoing AIIB-financed ISMEP Project. The Project will finance similar structural retrofitting and reconstruction of priority public buildings such as schools, hospitals and other social facilities. Recently, the IPCU has identified 69 additional educational buildings found to be unsafe and not in compliance with the seismic resilient building code at various levels. A preliminary study shows that retrofitting for many buildings is not technically and economically feasible. Therefore, reconstruction of these buildings will be required after demolishing the old structures. The KfW Development Bank project, which closed on June 30, 2023, financed the feasibility study reports for some of these additional buildings. Similar to the ongoing ISMEP project financed by AIIB, this additional financing Project comprises three components, as shown below: **Component A**: Enhancing Emergency Preparedness. This component aims to enhance the emergency preparedness of the City of Istanbul by strengthening the capacity of Istanbul's Provincial Directorate of Disaster and Emergency and other first responders. **Component B**: Seismic Risk Mitigation for Public Facilities. This component reduces the risk of future earthquake damage to critical public facilities to save lives and ensure their continued operation in the event of an earthquake. The component will mainly consist of retrofitting and reconstructing existing priority public facilities such as schools, hospitals and other social

	facilities (daycare centers, aged group homes for the elderly and orphanages, etc.). The component may also support feasibility studies, detailed designs and construction supervision. The Project's implementing entity, the IPCU, has already identified about 40 buildings to be included in the Project based on the ISMEP Program's established rules. **Component C**: Project Management Support. This component will support the IPCU to implement the Project efficiently and transparently and continue to build the institutional capacity to sustain the implementation of the Seismic Risk Mitigation and Preparedness program beyond the life of the Project.
Implementation Period	October 1, 2023 December 31, 2027
Expected Loan Closing Date	June 30, 2028
Proposed Amount of AIIB Financing	EUR150 million
Financing Plan	Project Cost EUR150 million
ES Category (or AIIB equivalent, if using another MDB's ES Policy)	B
ES Category Comments	B
Risk (Low/Medium/High)	Medium
Key Covenants	Maintaining the Project Implementation Agency and the Project steering committee throughout the Project, each with adequate budgetary and staffing allocations.
Retroactive Financing (Loan % and dates)	None
Policy Waivers Requested	No
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the proposed project complies with AIIB's applicable operational policies (Granted on September 7, 2023).

President	Liqun Jin
Vice President	Konstantin Limitovskiy
Acting Director General	Gregory Liu
Team Leader	Nat Pinnoi, Infrastructure Sector Senior Economist
Team Members	Pedro Ferraz, Environment Specialist Yi Geng, Senior Financial Management Specialist Bilal Muhammad Khan, Economist Yunlong Liu, Senior Procurement Specialist Irem Kizilca, Economist Liu Yang, Counsel Siyang Wang, Project Assistant

2. Project Description

A. Project Overview

1. **Country and Sector Context**. Despite the adverse impact of the COVID-19 Pandemic, the average annual Gross Domestic Product (GDP) of Türkiye during 2011-2020 was 5.2 percent, 1.2 and 1.4 percent higher than in the previous two decades.[1] The latest GDP growth registered an impressive 11.4 percent in 2021 during the peak of the COVID-19 pandemic. However, GDP growth has been achieved through the stimulation of credit and monetary measures, which has resulted in a rapid increase in inflation and deterioration of the value of domestic currency Turkish lira. Furthermore, the food and commodity supply shocks due to geopolitical tensions in early 2022 have exacerbated the increase in the price level and further depreciation of the lira.

2. The 2023 earthquakes measuring 7.8 and 7.5 in magnitude in the eleven southern provinces and the 2021 catastrophic flood in the Black Sea region have again highlighted how much Türkiye is vulnerable to seismic and climate risks. The overall impact of the recent earthquake is estimated to be around USD103.6 billion, equivalent to 9 percent[2] of the projected GDP for 2023. The 2023 earthquake prompted the Government of Türkiye to accelerate the country-wide retrofitting and reconstructing old public buildings built before 1999 to meet current seismic resilient standards. The Governorate of Istanbul has identified the last group of old school buildings built before 1999, requiring retrofitting or reconstruction in compliance with the Türkiye Building Earthquake Standard 2018 as early as possible to reduce their vulnerability against future seismic activities in Istanbul.

3. **Project Objective**. The objectives of the Project are to improve the disaster resilience of critical public facilities built before 1999 and to further enhance emergency preparedness and resilience of the City of Istanbul. These objectives are similar to the ongoing AIIB-financed ISMEP Project approved in 2019.

4. **Project Description**. Building on the highly successful ISMEP Program initiated and implemented by the World Bank from 2005-2015, the current ISMEP Program has since received support from many IFIs, including the AIIB-financed ISMEP Project. The Project will finance similar structural retrofitting and reconstructing priority public buildings such as schools, hospitals and other social facilities. Table 1 shows the list of ISMEP financiers, loan amounts and disbursed amounts.

[1] Computed by the author using data from the World Bank Data Portal https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=TR.
[2] Presidency of Strategy and Budget, April 2023, Türkiye Earthquake Recovery and reconstruction Assessment.

Table 1: Financier of ISMEP, as of May 1, 2023

Financier	Loan Amount (EUR)	Disbursement	Implementation Period
Closed Projects			
World Bank	310,000,000	305,463,096	Oct 18, 2005- Dec 31, 2012
European Investment Bank	300,000,000	300,000,000	Mar 12, 2008- May 31, 2016
Council of Europe Development Bank	250,000,000	250,000,000	Sep 16, 2010- Jun 30, 2015
World Bank-Additional Finance	109,800,000	109,800,000	Aug 04, 2011- Dec 31, 2015
Islamic Development Bank (Okmeydanı)	158,930,000	157,545,111	Apr 04, 2012- Mar 30 2020
Islamic Development Bank (Schools)	87,182,597	82,602,044	Apr 04, 2012- Jan 31, 2019
Islamic Development Bank (Tech.Services)	1,867,445	1,377,253	Apr 04, 2012- Jan 31, 2019
European Investment Bank-Additional Finance	300,000,000	300,000,000	Oct 29, 2013 – Dec 31, 2021
Council of Europe Development Bank- 2	250,000,000	250,000	Mar 12, 2015- Dec 31, 2022
Sub-Total (Closed Projects)	**1,767,780,042**	**1,507,037,504**	
Active and Forthcoming Projects			
KfW Development Bank	250,000,000	241,512,048	Jun 01, 2016- Jun 30, 2023
Asian Infrastructure Investment Bank	268,817,204	160,664,982	Jan 07, 2020-Dec 31, 2025
ECO Trade and Development Bank	40,000,000	22,604,184	Jun 23, 2020-Jun 23, 2024
Council of Europe Development Bank- 3	100,000,000	21,000,000	Sep 09, 2021-Dec 31, 2024
Asian Infrastructure Investment Bank-Additional Financing	150,000,000	N/A	Oct 01, 2023-Dec 31, 2027
Sub-total (Active and Forthcoming Projects)	**808,817,204**	**445,781,214**	
Total	**2,576,597,246**	**1,952,818,718**	

5. Recently, the IPCU has identified a backlog of 69 additional educational buildings built before 1999 that were found to be unsafe and not in compliance with the seismic resilient building code. A preliminary study shows that retrofitting is not technically and economically feasible for several buildings. Therefore, reconstruction of these buildings will be required after demolishing the old structures. The KfW Development Bank project, which closed on June 30, 2023, financed the feasibility study reports for some of these additional buildings.

6. **Expected Results**. The Project has significant potential benefits in protecting human lives and public assets, reducing injuries and increasing access to health services following a disaster. Indirectly, the Project also contributes to sustaining crucial economic activities in the commercial and industrial center of Türkiye, consequently making the country more resilient to crises caused by disasters. Furthermore, based on the recent findings from the previous ISMEP project, the completed retrofitted and reconstructed buildings have led to an increase in usable space and greater resource efficiency in terms of energy and water efficiency. Recycled material has been introduced and adopted as construction material when possible.

7. **Expected Beneficiaries**. Most earthquake-related fatalities are due to building collapse or damage. Therefore, the primary beneficiaries will be the occupants of the target public buildings (students and teachers at schools, patients and service providers at hospitals and clinics, and surrounding communities). The secondary beneficiaries will be ordinary citizens in Istanbul who can use strengthened schools as emergency shelters and have continuous access to medical services at safer hospitals even after a disaster. Public entities responsible for emergency preparedness and response in Istanbul will also benefit through capacity building activities.

B. Rationale

8. **Strategic fit for AIIB**. The Project aligns with the Green Infrastructure thematic priority by supporting the strengthening of the City of Istanbul's resilience against natural disasters, which are likely to be exacerbated by the impacts of climate change. AIIB's Sustainable Cities Strategy outlines five aspirational attributes for cities to attain: Green, Resilient, Efficient, Accessible and Thriving. The Project meets the green and resilient

objectives by making Istanbul's critical public buildings greener and more resilient towards natural disasters, including earthquakes, landslides and floods. The Strategy also states, "where health and education facilities are part of a more comprehensive/multi-sectoral integrated development that AIIB is considering to finance, AIIB will support the building of such facilities under this strategy as part of the broader integrated development." The Project is also part of a broad, multi-sectoral urban investment program aimed at increasing Istanbul's resilience to seismic shocks and thus aligned with AIIB's Sustainable Cities Strategy.

9. **Alignment with the Paris Agreement**. Türkiye ratified the Paris Agreement in October 2021 and updated its first Nationally Determined Contribution[3] (NDC) in April 2023. Through this updated NDC communication, Türkiye has confirmed its commitment to reduce Greenhouse Gas (GHG) Emissions by 41 percent by 2030 compared to the Business-as-Usual scenario in 2012. Türkiye also intends to peak its GHG emissions by 2038 and achieve a net zero target by 2053. Türkiye,[4] particularly Istanbul,[5] is highly vulnerable to the impacts of climate change and other natural hazards, such as seismic risks, due mainly to its geographical location and socioeconomic conditions.

10. This Project is aligned with the updated NDC[6] and the Paris Agreement's climate goals on mitigation (BB1) and adaptation (BB2). According to the Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations, the Project's main activity, Component B, can be classified as buildings and public installations that meet the green building standard. This is one of the Activities Considered Universally Aligned on climate mitigation goals under BB1. The green building standard referred to is the Excellence in Design for Greater Efficiencies (Edge) system[7] developed by the IFC for green building evaluation for emerging markets. The project also contributes 96.5 percent toward climate mitigation finance according to the Joint Methodology for Tracking Climate Change Mitigation Finance under the subcategory 3.2 Energy efficiency improvement in existing commercial, public and residential buildings.[8] The Project's building design incorporates energy-efficient lighting and appliances such as automatic on/off switches based on movement, insulation, energy-efficient heating and cooling systems, and resource-efficient equipment. The Project also contributes 3.5 percent toward climate adaptation finance to enhance emergency preparedness capacity and build climate resilience by incorporating rainwater harvesting, wastewater treatment and utilization of treated wastewater, and rainwater drainage in the building design when appropriate.

11. Although the Project's main design is to enhance the seismic resilience of public buildings, the design principle also includes climate resilient measures such as proper sizing of rainwater drainage systems during flooding events that could be further exacerbated by climate change. Water stress[9] is another key risk anticipated to be

[3] Republic of Türkiye, 2023, Updated First Nationally Determined Contribution.
[4] World Bank Group, 2022, Country Climate and Development Report.
[5] Istanbul Directorate of Environmental Protection, 2018, Istanbul Climate Change Action Plan.
[6] For mitigation and adaptation, please see Updated NDC p. 15 and p. 25, respectively.
[7] More information on the Edge system can be found at https://edgebuildings.com/.
[8] Joint Report of the Multilateral Development Banks' Climate Finance, 2020.
[9] Aygun, A. and T. Baycan, 2020, "Risk Assessment of Urban Sectors to Climate Change in Istanbul," Economic and Social Changes: Facts, Trends, and Forecast, Vol. 13, No. 3, 2020.

heightened due to climate change. Therefore, water conservation through various measures is part of the Project design, including automatic on/off water tap, rainwater harvesting and reclaimed wastewater for irrigation purposes. These are some of the leading climate risks facing the city of Istanbul identified by the Istanbul Climate Change Action Plan[10]. Finally, none of the target buildings are located close to the coastline; therefore, the risk of impact from sea level rise is low. Therefore, the Project is aligned with the adaptation and climate resilience operations (BB2) according to three criteria of the Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations: Criteria 1 – climate risk and vulnerability of Istanbul have been identified; Criteria 2 – Climate resilient measures have been included in the Project design; and Criteria 3 – the Project is consistent with the country Updated NDC as well as the Istanbul Climate Change Action Plan.

12. **Alignment with Country's Strategy**. After the Marmara earthquake in 1999, the Government of Türkiye enhanced its efforts to develop and implement a comprehensive hazard risk management strategy for the country. At the local level in Istanbul, both the municipality and the provincial governorship demonstrated commitment to seismic risk mitigation by implementing risk assessment and planning activities leading to the Earthquake Master Plan for Istanbul. This has been internationally recognized as a strategic instrument for addressing seismic risk in a highly vulnerable mega-city. In addition, the Government invested in revising and updating the building code in 2000, 2007 and 2018. Furthermore, this project is well aligned with the country's 12th National Development Plan, which is currently being prepared for the 2024-2028 period, an updated NDC 2023 and Istanbul's Climate Change Action Plan 2018 on mitigation and adaptation as described above.

13. **Value addition by AIIB**. AIIB's financing will contribute to resource mobilization, making Istanbul more resilient and safer. It will help meet the urgent financing needs of strengthening critical public buildings against earthquake risks in Istanbul. The Project will replicate and expand the successful model supported by other IFIs. AIIB will help ensure that retrofitting and reconstruction work under the Project meets the national building code and international standards for earthquake resistance.

14. **Value addition to AIIB**. Joining international efforts to make Istanbul more resilient, which will save human lives and prevent damage to public assets, will enhance AIIB's institutional brand image. The Project will also diversify AIIB's portfolio in Türkiye, continuing the first urban project in the country. Finally, it will lead to increased technical knowledge of staff in disaster risk mitigation and green and resilient buildings, proving useful in light of the recent earthquake in Türkiye.

15. **Lessons learned**. Key lessons learned from the World Bank's ISMEP project and the AIIB's ISMEP project, which have been incorporated into the design of the ISMEP Additional Financing Project, are as follows:

16. A semi-autonomous professional project coordination unit (IPCU) has demonstrated effectiveness and efficiency in project implementation. Reporting to the Istanbul Governorate, the IPCU has been established outside the government's standard budget procedures. IPCU has been able to attract, develop and retain

[10] *Op. cit*. Istanbul Directorate of Environmental Protection, 2018.

significant technical expertise and project management experience, resulting in high-quality outputs in a timely and cost-effective manner.

17. The building design that includes functional upgrades (to modern service provision standards) makes disaster risk reduction investments for public facilities more effective and sustainable as well as provides many co-benefits, e.g., technology-enabled classroom, sustainable construction material (e.g., recycled material), resource efficiency, added usable space to enhance learning and sporting experience, and shelter during a disaster. The ISMEP program has supported extensive coordination with the Provincial Directorates of Health and Education and administrators of individual facilities to ensure that the design and retrofitting plans (and the associated budget allocations) consider service quality and required functionalities. This generated strong support for the primary investments in risk reduction, even though the work caused unavoidable disruption to the operation of the facilities.

18. Early involvement of project beneficiaries and multiple stakeholders in the planning and execution of the retrofitting/reconstruction was crucial to successful project implementation. Most of the schools are located in active communities, which could easily lead to complaints from disruption of daily lives during construction. Furthermore, school principals, teachers, students and parents were initially concerned about the adjustment required to move from schools selected for retrofitting or reconstruction to other schools during construction. However, the transparency of the processes and engagement with the beneficiaries contributed to a positive outcome through consultation with school principals and hospital directors throughout the facility selection, design and tendering processes. This allowed arrangements to be in place well before relocating the students to host schools. Finally, early engagement with relevant authorities to obtain necessary permits will ensure timely delivery.

C. Components. Similar to the AIIB ISMEP project, this additional financing comprises three components, as shown below.

19. **Component A**. Enhancing Emergency Preparedness. This component aims to enhance the emergency preparedness of the City of Istanbul by strengthening the capacity of Istanbul's Provincial Directorate of Disaster and Emergency and other first responders. Specifically, the component will support (i) provision of emergency equipment such as IT and emergency communications equipment, medical rescue and equipment, search and rescue equipment, and specialized emergency vehicles, etc.; (ii) public awareness and training; and (iii) any technical assistance to enhance emergency preparedness and responses. As the ISMEP program has been supported by several development partners and under implementation for several years, the required capacity supported by Component A has been strengthened over the years. Therefore, the required financing for this component is around 10 percent of the Component C Project Management Support, as requested by the Government.

20. **Component B**. Seismic Risk Mitigation for Public Facilities. This component reduces the risk of future earthquake damages to critical public facilities to save lives and ensure their continued operation in the event of an earthquake. The component mainly consists of retrofitting and reconstructing priority public facilities such as schools, hospitals and other social facilities (daycare centers, aged group homes for the elderly, orphanages, etc.). The component will also support feasibility studies, detailed designs

and construction supervision. The Project's implementing entity, the IPCU, has already identified about 40 buildings to be included in the Project based on the original ISMEP project's established rules (See Annex 2). Among the 40 buildings, retrofitting is planned for 20, while reconstruction is required for the other 20.

21. **Component C**. Project Management Support. This component will support the IPCU in implementing the Project efficiently and transparently and continue to build the institutional capacity to sustain the implementation of the Seismic Risk Mitigation and Preparedness program beyond the life of the Project. Specifically, the component will comprise the IPCU's operational costs and project management support, including monitoring and evaluation, environmental and social safeguards, procurement and financial management.

D. Cost and Financing Plan

Project Component	AIIB (EUR million)
Component A: Enhancing Emergency Preparedness	5.20
Component B: Seismic Risk Mitigation for Public Facilities	140.50
Component C: Project Management Support	4.30
Total	150.00

E. Implementation Arrangements

22. **Implementation period**. October 1, 2023 – December 31, 2027

23. **Implementation readiness**. The Project will adopt the existing implementation arrangements established under the ISMEP project used by the other IFIs in their own ISMEP projects. The implementing agency is the IPCU, established under the Istanbul Governorship. IPCU is headed by a Project Director who reports directly to the Governor of Istanbul or his deputy. IPCU is currently composed of 41 staff, of which 34 are professionals from the fields of procurement, financial management, civil engineering, mechanical engineering, electrical engineering, architecture, urban planning, communication, monitoring and evaluation and legal expertise, and seven support staff. Consulting firms and individual consultants provide the required specific technical support for the preparation of feasibility studies, technical specifications, retrofitting and reconstruction designs, construction supervision and ES inspection and reporting.

24. **Procurement**. The procurement of goods, works and consulting services contracts funded partially or in whole by AIIB under the Project shall be conducted following AIIB's Procurement Policy dated January 2016 and revised on November 22, 2022, and its Interim Operational Directive on Procurement Instructions for Recipients dated June 2, 2016 (PIR). IPCU, as an existing and experienced government public entity, will be responsible for the procurement and contract management of the Project with the support of externally hired technical and supervision consulting firms and individual experts.

25. For the implementation of the Project, the IPCU prepared and submitted a draft Project Delivery Strategy together with a Procurement Plan (PP) for AIIB's review and

comments. The Project Delivery Strategy and PP have been further revised and finalized as per AIIB's comment during Project preparation and are acceptable to AIIB. Specific procurement arrangements, including contract packaging, cost estimates, procurement methods, procurement timelines and prior review requirements, etc., have been detailed in the PP. The PP will be updated regularly or as needed for AIIB's review and no objection during Project implementation. The Bank's review may include objections or no objections with certain conditions. IPCU will carry out the Project procurement under the specific procurement arrangements of the PP.

26. When the procurement method of a contract is International Open Competitive Tendering or International Open Competitive Selection, the Bank's Standard Procurement Documents for goods, works and services disclosed at the AIIB website shall be adopted as a mandatory requirement. For any contract to be procured through National Competitive Tendering (NCT) or National Competitive Selection, the IPCU Model Bidding Documents in the Turkish language, respectively for Goods and Works contracts, which have been accepted and used for the World Bank-funded and other IFI-funded projects, will be used for the procurement of NCT Works and NCT-Goods contracts. These Model Bidding Documents have been modified to reflect AIIB's policy requirements in the AIIB-financed ongoing project.

27. Advance procurement may be carried out before the planned loan agreement signing date. Retroactive financing under the Project is not anticipated as the IPCU has no working capital to finance such contracts in advance.

28. AIIB will conduct regular supervision of the Project's procurement performance and reviews before and after procurement following the updated procurement plan agreed upon by the Bank.

29. **Financial Management**. The financial management system maintained by the IPCU has been continuously managing IFI-financed ISMEP projects since 2005. The financial management unit is responsible for financial planning, reporting, budget preparation, payments, accounting, internal control and compliance with legislation. The Project will continue to provide interim financial statements semi-annually, and the annual project audit report issued by auditors acceptable to the Bank will also be provided within six months after the end of each year of the implementation period. The legal covenants are well complied with for the project under implementation, and no major issues were noted during the recent implementation supervision mission.

30. **Environmental and Social**. The Project will adopt the existing implementation arrangements concerning the ESMPF established under the ISMEP project and adopted by the other IFIs in the ISMEP program. The implementing agency is the IPCU, established under the Istanbul Governorship.

31. **AIIB's Implementation Support**. During project implementation, AIIB plans to field a mission twice a year to support and monitor the project activities. If necessary, AIIB may hire a short-term structural engineering consultant experienced in seismic risk reduction and another consultant in procurement post-review. These consultants should be part of the implementation support missions.

3. Project Assessment

A. Technical

32. **Project Design**. IPCU has identified 39 schools and one childcare building to be included in the Project. These are priority public buildings outside of those already committed by other IFIs based on the established criteria. Over half of these selected buildings, feasibility studies and building designs are either completed or underway. IPCU continues to identify other relevant structures before selecting priority projects to be supported under the Project.

33. The technical approach to the seismic strengthening of public buildings is two-fold: retrofitting structures where technically feasible and building reconstruction where the existing inferior quality does not allow for a reasonable retrofit. The criteria for (demolishing and) reconstructing existing vulnerable buildings include minimal remaining economic life and estimated retrofitting costs higher than 40 percent of the cost of a new building of the same size.[11]

34. Construction measures for retrofitting follow conventional engineering methods well-known in Türkiye and internationally, such as adding reinforced concrete shear walls, jacketing inadequate columns and expanding building foundations. Advanced technologies, such as base isolation, will be introduced where appropriate. Seismic retrofitting increases strength such that a building can reach a minimum level of structural performance at the expected earthquake intensity level. This results in three distinct but related benefit streams: (i) avoided fatalities, (ii) avoided direct structural damage and (iii) service continuity for public facilities.

35. Operational sustainability. The maintenance of the seismically strengthened structures after the Project implementation period will follow standard building procedures. Line ministries are responsible for allocating funds for any cost needed for the operations and maintenance of these buildings. The building designs under the World Bank-financed project used better and more durable materials, including factors that reduced maintenance, especially for building exteriors. Designs emphasized resource efficiency regarding water, energy and gas consumption, leading to lower operations and maintenance costs. The Project will also adopt similar designs where possible.

B. Economic and Financial Analysis

36. **Economic Analysis**. The economic analysis for the Project is based on a similar model used in the ISMEP project, which is a cost-benefit methodology to calculate the Economic Internal Rate of Return (EIRR) and Economic Net Present Value (ENPV) of the Project. The economic benefits focus on protecting human lives, increasing earthquake resilience of public buildings, and energy savings and the subsequent reduction in Greenhouse Gas emissions.[12] Moreover, the Project will generate many other traditional economic benefits for the users of infrastructure, including (i) improved

[11] This criterion aligns with the United States Federal Emergency Management Agency's guidelines.
[12] The energy savings and GHG emission reduction figures were provided by the IPCU as a part of the Energy Efficiency Analysis (2022) of 25 completed school buildings.

sustainability of infrastructure, (ii) improved quality of services provided in retrofitted/reconstructed schools and the childcare center and (iii) better usage of green technologies, etc. However, these additional benefits are not calculated due to their complexity and the absence of data and resources required to undertake such an analysis. The project's total cost mainly includes capital expenditures and related expenses to retrofit and reconstruct the target buildings and operation and maintenance expenses to be covered by the Istanbul Directorate of Education.

37. The cost-benefit analysis applied with costs and benefits defined based on "with" and "without" scenarios. Baseline scenarios are defined and calculated as a scenario where 40 buildings would not be retrofitted and/or reconstructed. Without the project, the proposed 39 schools and one childcare center would continue education under poor conditions with high seismic risk. With the project, these facilities will not only withstand the destructive effects of a potential earthquake but also provide better educational services and associated social services such as public meetings and sheltering during a disaster. To maintain consistency with the ISMEP Project, most assumptions used in the ISMEP Project have also been used in this Project except the following data that were updated to reflect the current context: GDP per capita, number of average students per school, average life expectancy, average area of school and number of building projected.

38. Energy savings, which include electricity (USD0.09 per square meter) and natural gas (USD0.12 per square meter), have been included in the analysis along with their GHG emission reduction (7.7 kilograms of Carbon Dioxide equivalent, $kgCO_2e$ per square meter) based on the IPCU study[13] of 25 completed school buildings. The average annual savings are around USD60,000 and USD122,000, respectively. GHG emission reduction has been monetized by the 'low' shadow prices, according to the Policy and Strategy Note 2018 No. 1, Shadow Carbon Pricing in the Economic Evaluation of AIIB Projects.

39. Based on available data and the assumptions adopted, the estimated EIRR for the Project is 16 percent per annum and an ENPV of USD40 million, comparable to the original ISMEP project estimates of 17.8 percent and USD55 million, respectively. A Social Discount Rate (SDR) of 10 percent per year used in the ISMEP Project analysis is also adopted here. However, it should be noted that a long-term growth rate of GDP per capita or its proxy, such as an annual average growth of real GDP per capita, can also be used as the SDR. According to the World Bank data portal, the annual average real GDP per capita growth of Türkiye from 1961-2021 was 2.9 percent. Therefore, using the SDR of 10 percent is a very conservative assumption. A sensitivity analysis has been carried out for a 20 percent increase in construction costs, resulting in an EIRR of 12 percent, which is still higher than SDR, and a positive ENPV of about USD17 million. Based on the OECD Education at a Glance 2022 report, the average annual increase in teacher salaries in Türkiye during 2010–2021 was around 1.05 percent. Since salaries account for 95 percent of the total operating expenses, the sensitivity analysis is based on tripling the historical annual salary growth to 3.15 percent, yielding an EIRR of 12 percent and ENPV of about USD12 million. More information is provided in Annex 3.

[13] Ibid.

40. **Financial Analysis**. Because K–12 public education in Türkiye is free, a financial analysis for the Project is not applicable. However, the lessons from the ISMEP project show significant operational cost savings from incorporating energy and resource efficiency into the Project's technical design. Instead, the financial analysis focused on savings in operational costs based on analyzing 25 completed school buildings. For reconstructed and retrofitted schools, the data showed a reduction in total operational costs, consisting of electricity, natural gas and water bills, of 30.5 percent and 24 percent, respectively. Replacement and maintenance of materials over the life of the structures were not considered. The schools achieved an average annual total operational cost per square meter of USD0.26 after reconstruction and USD0.15 after retrofitting. Applying the same assumptions to the Project's targeted facilities results in the summary of expected combined operational cost savings of around USD48,000 per year under the Project.

C. Fiduciary and Governance

41. **Procurement**. During the appraisal mission, the Bank conducted further procurement capacity and risk assessment of the IPCU and the Project. According to AIIB's Procurement Policy, the IPCU has sufficient capacity to undertake Project procurement and contract management.

42. IPCU Procurement staff are well versed in national and international procurement methodologies with long implementation experience with the World Bank and other IFIs that financed projects in the last 17 years of the ISMEP project's implementation. They are also familiar with AIIB's Procurement Policy through implementing the ISMEP project since 2019 when the procurement process began. Several contracts have been launched, awarded, signed and implemented. The procurement team has demonstrated trustworthy and efficient performance on procurement processes, including procurement planning, publications, bidding, evaluation and timeliness of procurement, and contract management.

43. Based on the above procurement assessment, it can be concluded that the IPCU has sufficient institutional and procurement capacity and is experienced to ensure the successful implementation of Project procurement. Therefore, the Project procurement capacity and risk assessment are rated as Low.

44. **Financial Management**. IPCU's financial management system was established under the World Bank-financed project in 2005, then continuously improved and maintained to manage various IFI-financed projects. The Project financial team led by the IPCU's Deputy Director in charge of finance comprises seven personnel to perform the different functions of accounting, reporting, cashier and disbursement, with appropriate review and segregation of duties. Most have worked in the IPCU for over 10 years, managing various loans financed by the World Bank, European Investment Bank, Islamic Development Bank, etc. The personnel are familiar with working procedures and AIIB's requirements.

45. The Project has continuously used the computerized accounting system (Logo) to keep accounting records on a cash basis with multiple currencies (for foreign currency transactions) and generate project financial statements electronically. Such a system

has been widely used in Türkiye and was updated regularly. An individual profile is set up for each project in the computerized accounting system.

46. Sound internal controls are in place, and each payment request has been processed with necessary reviews by the technical team, field engineers, supervising engineers, senior engineer/architect, deputy directors, etc. The IPCU Director and Deputy Director in charge of finance sign the payment release. Prior years' audit report/Management Letter noted no significant outstanding control issues. The Financial Management Manual has been updated to standardize project financial management work. Following the government system of IFI-financed operations in Türkiye, the Ministry of Treasury and Finance will conduct the annual project audit. The overall project financial management system will ensure that AIIB loan proceeds are used efficiently and effectively.

47. **Disbursements**. The proceeds of the loan will be disbursed mainly through the advance method. Project Designated Account (DA) in EUR will be opened in the Central Bank and managed by the IPCU. A Project Account in TRY was opened in Vakıfbank. For each due payment, the IPCU makes an exchange from the DA and transfers the required amount to the Project Account in Vakıfbank, then pays contractors after deducting the withholding tax. The following month, such tax will be filed and turned over to the tax authority. The ceiling of the DA will be a fixed EUR15 million amount according to government financial regulations. All withdrawal applications will be prepared by the IPCU and approved by the IPCU Director and Deputy Director. The approved withdrawal application will be submitted to the Ministry of Treasury and Finance for final approval, signature and onward submission to AIIB. The disbursement arrangements, including applicable ceilings and limits, will be documented in the disbursement letter and finalized before loan negotiations.

48. **Financial Crime and Integrity (FCI) and Counterparty Due Diligence/Know Your Counterparty (CDD/KYC).** Under applicable AIIB's policies and guidelines, KYC/FCIDD has been carried out to assess Financial Crime (FC) risks, including Money Laundering and Financing of Terrorism (ML/FT) risks, Sanction risks, and risks deriving from Integrity Unsoundness when dealing with its Counterparties and Connected Parties in the financing. Integrity screenings have been performed on the state representatives of the Government of the Republic of Türkiye and senior management of the Ministry of Treasury and Finance and the IPCU. The potential authorized person to sign financing agreements with AIIB was not found to be identified by Word-Check One as politically exposed persons (PEPs).

49. **Governance and Anti-corruption**. A high-level multi-stakeholder steering committee chaired by the governorship made overall decisions on prioritizing different sectors for investment. This will help balance competing priorities across stakeholders and help to ensure the loan funds are transparently and properly allocated to disaster mitigation efforts. In addition, the Project will select investment priorities within sectors using a transparent points system based on risk and utility, drawing on technical data about buildings, capacity, accessibility, proximity to fault lines and other factors. This will help to avoid subjective decision-making and disputes between beneficiaries and stakeholders.

50. **AIIB's Policy on Prohibited Practices**. AIIB is committed to preventing fraud and corruption in its financing. It prioritizes ensuring that the projects it finances are implemented in strict compliance with AIIB's Policy on Prohibited Practices or PPP (2016). AIIB reserves the right to investigate, directly or indirectly through its agents, any alleged Prohibited Practices relating to the Project and take necessary measures to prevent and redress any issues as appropriate.

D. Environmental and Social

51. **Environmental and Social Policy, Standards, Categorization**. AIIB's Environmental and Social Framework (ESF) (2022) applies to the Project. The Project has been prepared consistent with the Environmental and Social Policy (ESP), including the Environment and Social Standards (ESSs) and the Environmental and Social Exclusion List. ESS 1 (Environmental and Social Assessment and Management) applies to the Project. ESS 2 (Land Acquisition and Involuntary Resettlement) and ESS 3 (Indigenous Peoples) are not triggered. Project activities will not cause involuntary resettlement, and no Indigenous Peoples are present in or have a collective attachment to the Project area. The ESP assigns the Project a Category B due to the limited number of potentially adverse environmental and social impacts of the construction activities that can be successfully managed using good practice in an operational setting.

52. **Instruments**. An Environmental Management Plan (EMP) was prepared per the Environmental and Social Safeguard Policies of the World Bank and has been in place since the program's inception in 2005 and was updated in 2010. The EMP was further revised in 2019 as part of this Project to reflect new regulatory requirements in Türkiye and to codify existing practices related to stakeholder engagement and grievance management. In addition, the Project prepared an Environmental and Social Completion report, and the EMP was revised to incorporate the AIIB's ESF (2022).

53. **Environmental Aspects.** The Project is not expected to have any significant impact on any sensitive environmental receptors. Construction activities will temporarily result in localized noise, dust and combustion emissions; construction waste generation; and potentially sedimentation of the sewage system on and near project sites. Off-site impacts will be induced by the production of construction materials, including but not limited to the use of natural resources such as water and energy consumption, their transportation to the site, and the disposal of debris and other waste. The EMP has special provisions for hazardous waste materials such as asbestos and sensitive impacts such as noise and dust management.

54. **Climate Change**. The Project contributes to Türkiye's Updated NDC and Paris Agreement by improving energy efficiency through retrofitting and reconstructing existing buildings.[14] The Project will improve energy and water efficiency and structural resilience to seismic events of the targeted buildings. These buildings will be designed and certified to Turkish Energy Identify Certificate (Rank B) or international green building standards. Since Türkiye is highly vulnerable to climate change, especially extreme precipitation and prolonged drought, flood protection and water conservation measures are also included in the design criteria.

[14] Republic of Türkiye, 2023, *op. cit*.

55. **Social Aspects**. The Project will not induce any physical or economic resettlement. Social impacts will comprise construction-induced nuisances such as noise, dust emissions, access restriction, and community health and safety risks. This is especially true for adjacent residents and structures and concurrent users of facilities or buildings being renovated while potentially in partial use, such as schools or hospitals. Public buildings targeted for reconstruction will adopt universal design principles.

56. The reconstructed and retrofitted schools are also built with added sustainability aspects, promoting additional benefits to the students, teachers, parents and neighboring communities. This includes more usable space, accessibility, technology-ready features (Wi-Fi and LAN networks, graphic and visual networks, and an uninterrupted power supply), noise protection, energy and resource efficiency, recycled materials, renewable energy and water resources, fire management, disaster protection and emergency shelter.

57. **Cultural Resources**. None of the targeted buildings are located within registered cultural heritage areas. However, due to the historical nature of Istanbul, activities to be conducted as part of the Project may occur adjacent to or near important cultural resources. During Project preparation, one contractor reported a 'Chance Find' associated with a previously retrofitted building, and two buildings had monument/registered trees onsite. For buildings near known cultural resources such as registered trees, contractors must receive approval from the Regional Preservation Council, and mitigation measures must be implemented to protect the cultural resource. In the 'Chance of Finds' case, the Regional Preservation Council will assign an expert to supervise excavation under an approved plan.

58. **Stakeholder Engagement, Consultation, and Information Disclosure.** All construction projects are subject to public consultations, as Turkish regulations require. The process includes public hearings, focus group discussions, interviews, surveys and communication materials. Particular attention will be paid to the inclusion of men and women in all consultations to ensure respective priorities and concerns are considered, particularly in the planning and execution of the Project. An executive summary of the EMP is available on the Project's website.[15]

59. **Gender and Accessibility Aspects**. All schools and hospitals are designed using accessibility facilities such as ramps and elevators and have adequate facilities for women, such as separate bathrooms. As part of the Project’s enhancement, the IPCU will include Gender-Based Violence training sessions in the EMP and opportunities for equal access to employment will also be identified. In addition, the Project will use universal design features for people with disabilities.

60. **Community, Occupational Health and Safety, Labor and Employment Conditions.** During Project preparation, the Bank's environmental and social specialist interviewed the contractors and supervising engineers at several construction sites. As a result, occupational health and safety practices were assessed as adequate, and good record-keeping onsite was observed. In addition, the size and composition of the workforce were reviewed to assess potential labor risks. Most sites had small workforces

[15] https://www.ipkb.gov.tr/wp-content/uploads/2019/10/ISMEP-Executive-Summary.pdf.

(peak of 120-150 workers) comprised of skilled local labor. Additionally, the Project does not employ day labor or migrant workers.

61. Project activities will involve construction risks such as earthworks, excavations, work in height, noise, underground activities and electrical hazards. The Contractors will develop management plans under the EMP. The Contractors will implement an occupational health and safety plan, including work-related accident prevention and an emergency response plan. IPCU is responsible for monitoring the implementation of the mitigation measures. The Contractors must adopt and implement Human Resource policies aligned with AIIB's requirements, especially for preventing Labor Working Conditions issues across their operations and those of the contractors and subcontractors.

62. **Project Grievance Redress Mechanism and Bank's Project-Affected People's Mechanism.** A Project-level Grievance Redress Mechanism (GRM) has been developed and implemented, which includes multiple channels for stakeholders to raise grievances to the IPCU and a process for investigating and responding to grievances. During Project preparation, the functionality of the GRM was assessed through a review of several successfully closed cases. As a result, a second GRM will be established for project workers as a condition for the financing.

63. **AIIB's Accountability Mechanism.** AIIB's Policy on the Project-affected Peoples Mechanism (PPM) applies to this Project. The PPM has been established by AIIB to provide an opportunity for an independent and impartial review of submissions from Project-affected people who believe they have been or are likely to be adversely affected by AIIB's failure to implement the ESP in situations when their concerns cannot be addressed satisfactorily through the GRM or the processes of AIIB's Management. Information on AIIB's PPM is available at: https://www.aiib.org/en/policies-strategies/_download/project-affected/PPM-policy.pdf.

64. **Monitoring and Supervision Arrangements.** IPCU will be responsible for the overall coordination, supervision, and monitoring of the Project's environmental and social aspects to ensure compliance with Bank ESP requirements. IPCU has established an environmental and social specialist team to oversee Project implementation and monitor environmental and social aspects. IPCU will provide AIIB with annual environmental and social monitoring reports during the Project period. In addition, AIIB will conduct supervision missions in line with the Bank's implementation support missions and strengthen the IPCU's environmental and social management efforts.

E. Risks and Mitigation Measures

65. The project's overall risk is medium because the ISMEP program is well-established and highly satisfactory. IPCU is a semi-autonomous, competent professional implementing agency. Many stakeholders identified the performance of the IPCU as a significant driver of the success of the World Bank-financed ISMEP project (World Bank's IEG 2018). The overall implementation of the ISMEP project is satisfactory, with tangible results on the ground. A summary of the risks is presented in Table 2 below.

Table 2: Summary of Risks and Mitigating Measures

Risk Description	Assessment (H/M/L)	Mitigation Measures
Environmental and Social Risk The Project's physical component targets only the existing buildings. No land acquisition or resettlement will be required. The environmental and social impacts are expected to be localized and temporary during the construction.	Low	An Environmental Management Plan has been prepared to mitigate these minor impacts. IPCU has extensive experience managing projects per MDB's requirements, such as the World Bank and the EIB. IPCU ES's performance during the ISMEP project has been satisfactory.
Stakeholders Risk Stakeholder support for the Project is critical. Such stakeholders involve line ministries and medical service providers in the case of hospitals and teachers/parents/students in the case of schools.	Low	The Project will ensure stakeholder consultations at the building design stage. IPCU has adequate mechanisms and experience in managing various stakeholders, as evidenced during the implementation of the ISMEP project.
Technical Risk	Low	IPCU has several experienced technical staff. AIIB may also hire a short-term consultant (structural engineer experienced in seismic risk reduction) to ensure international standards for retrofitting and reconstruction.
Fiduciary Risk	Low	IPCU has demonstrated a solid track record of managing procurement and financial management aspects during the implementation of the ISMEP Project. AIIB will continue to provide necessary fiduciary support and advice to the IPCU and monitor its performance and potential fiduciary risks, if any, during its implementation.
Institutional Risk Institutional sustainability of the IPCU is uncertain after the	Medium	AIIB will continue to dialogue on institutional sustainability and monitor the performance of the

Risk Description	Assessment (H/M/L)	Mitigation Measures
Project closes. Also, changes in Director and other experienced IPCU staff for whatever reasons may adversely affect Project implementation.		IPCU and support its capacity building.
Foreign Exchange and Price Level Risks During the implementation of the ISMEP project, Türkiye experienced significant depreciation of the local currency against the USD and EUR and rapid price level increases leading to contract adjustment and/or termination according to the new laws issued in 2022.	High	IPCU has been adapting to the volatility in both foreign exchange and price levels by periodically reevaluating the market price for construction work and material. The contracts have been awarded in the local currency and the loan is in EUR, providing a reasonable hedging outcome.

Annex 1: Results Monitoring Framework

Project Objective:	The project's objectives are to improve the disaster resilience of critical public facilities built before 1999 and to further enhance emergency preparedness and resilience of the City of Istanbul.									
Indicator Name	**Unit of measure**	**Base-line** 2022	**Cumulative Target Values**					**End Target 2027**	**Frequency**	**Entity**
			2023	**2024**	**2025**	**2026**	**2027**			
Project Objective Indicators:										
1. Number of beneficiaries (students, teachers, etc.) having access to disaster-resilient public facilities	Person	0	0	0	9,100	18,200	31,850	31,850	Annual	IPCU
2. Number of key public facilities retrofitted or reconstructed under the project to resist a major earthquake	Number of buildings	0	0	20	30	39	40	40	Bi-annual	
Intermediate Results Indicators:										
1. Percentage of buildings with improved energy efficiency under the project	Percent	0	0	25	40	70	100	100	Annual	IPCU
2. Number of school communities reached out to via consultation meetings and awareness programs	Number of communities	0	10	20	40	40	40	40		

Annex 2: Detailed Project Description

1. The project's main component will finance structural strengthening of about 40 public buildings through retrofitting or reconstruction (39 schools building and one childcare center). Among the 40 buildings, retrofitting is planned for 20 buildings while reconstruction is required for the other 20 buildings. The building designs for these buildings are either completed or underway.

2. The selection of these buildings was conducted by using the criteria established under the ISMEP project. The selection process is as follows:

3. Under the leadership of the Istanbul Governorship, a comprehensive inventory of critical facilities was developed through a transparent prioritization process involving stakeholder agencies, using building-specific technical data, transport access data (hospitals and schools), distance from fault lines, importance in the Istanbul Disaster Management Plan, population onsite and general population served and other relevant characteristics depending on the type of facility, taking account criteria for each sector as indicated in the weighting formula tables below.

Table 1: Prioritization Criteria for Schools

No.	Criteria			Score
1	**ACCESSIBILITY DURING DISASTER** (×0.10) Access between 0-100			10
2	**TECHNICAL FEATURES OF BUILDING** (×0.40)			40
	Construction Year (×0.20)			20
	(a) before 1965 (100)	(b) between 1965 - 1980 (60)	(c) after 1980 (40)	
	Number of story (×0.20)			20
	(a) > 5 stories (100)	(b) 3 – 4 stories	(c) 1 – 2 stories	
3	**DISTANCE TO EPICENTER** (×0.10) Distance to the Fault Line > 20 km (40) Distance to the Fault Line < 20 km (100)			10
4	**Importance in Disaster Management Plan (Strategical Location)** (×0.10)			10
5	**Number of Students** (x0.20) 0 – 500 Students (30) 501 – 1,000 Students (60) >1,000 students (100)			20
6	**Working Hours** (x0.10) Half-Day (50) Whole Day (100)			10
Total				100

4. The ISMEP project has developed the design principles which will be adopted under the Project, wherever possible. Some of the key principles include:

a. **Durability and lower maintenance cost**: (i) reinforced concrete used as exposed surface and only protective materials applied to buildings against dust emission and water; (ii) avoid plastering and painting in order to decrease workforce and minimum chemicals for painting; (iii) artificial stones and marble used for extreme durability and extended lifespan of floors; and (iv) consider recycled material when feasible.

b. **Energy efficiency**: (i) shafts designed for natural ventilation at each classroom; (ii) external thermal insulation systems used on roofs, basements and façades in every building; (iii) shading elements on façades and low emissivity window glasses used in every building to avoid unrequired thermal load caused by sunlight; (iv) windows and architectural design of classrooms and corridors to benefit from natural sunlight as much as possible to prevent the electric lights use in daytime; (v) install roof-top solar panels where possible; (vi) modern lighting system with energy saving used such as LED bulbs; (vii) different heating circuits in different zones of a building, enabling to reach the maximum heating efficiency capacity; and (viii) automatic lighting sensors.

c. **Water conservation**: (i) automatic sensor faucets; and (ii) rainwater harvesting for flushing toilets and watering gardens.

d. **Technology Enable**: (i) the design will include the readiness for both wired and wireless communication and Internet network and (ii) interactive board.

e. **Universal design**: (i) elevators designed for disabled in every school; (ii) WC designed and installed for disabled children in every floor in every school; and (iii) access slope for wheelchair ramps.

Annex 3: Economic and Financial Analysis

1. The economic analysis for the Project is based on a similar model used in the ISMEP project, which is a cost-benefit methodology to calculate the Economic Internal Rate of Return (EIRR) and Economic Net Present Value (ENPV) of the Project. The economic benefits focus on protecting human lives, increasing earthquake resilience of public buildings, and energy savings and the subsequent reduction in Greenhouse Gas emissions.[1] Moreover, the Project will generate many other traditional economic benefits for the users of infrastructure, including (i) improved sustainability of infrastructure, (ii) improved quality of services provided in retrofitted/reconstructed schools and the childcare center and (iii) better usage of green technologies, etc. However, these additional benefits are not calculated due to their complexity and the absence of data and resources required to undertake such an analysis. The project's total cost mainly includes capital expenditures and related expenses to retrofit and reconstruct the target buildings and operation and maintenance expenses to be covered by the Istanbul Directorate of Education.

2. The cost-benefit analysis applied with costs and benefits defined based on “with” and “without” scenarios. Baseline scenarios are defined and calculated as a scenario where 40 buildings would not be retrofitted and/or reconstructed. Without the project, the proposed 39 schools and one childcare center would continue education under poor conditions with high seismic risk. With the project, these facilities will not only withstand the destructive effects of a potential earthquake but also provide better educational services and associated social services such as public meetings and sheltering during a disaster. To maintain consistency with the ISMEP Project, most assumptions used in the ISMEP Project have also been used in this Project except the following data that were updated to reflect the current context: GDP per capita, number of average students per school, average life expectancy, average area of school and number of building projected.

Table 1: **Key Data and Assumptions**

Assumption	Unit	Value	Source
GDP per capital (2021)	USD	9,661	World Bank Data Portal
Average life expectancy	year	76	
Earthquakes exceeding Mw = 7 have an annual exceedance probability of	percent	2	www.thinkhazard.org
Mortality rate	percent	4.1%	Conservatively adjusted downward from data from the figure from the 1999 Marmara earthquake of 6.28%
Value of Lives Saved	USD	1,712,000	GFDRR
Annua Discount Rate	percent	10	ISMEP Project

[1] The energy savings and GHG emission reduction figures were provided by the IPCU as a part of the Energy Efficiency Analysis (2022) of 25 completed school buildings.

Assumption	Unit	Value	Source
Exchange rate (May 30, 2023)	TRY/USD	20.31	Central Bank of Republic of Türkiye
Average number of students per school	number	880	IPCU
Average number of school personnel per school	number	45	
Average floor areas school	sq. m.	8,000	
Number of buildings protected	number	40	
Average building value	USD per sq. m.	4,000	ISMEP Project
Energy (electricity and gas) savings		0.09	IPCU (based on actual data from 25 completed schools)
Annual Greenhouse gas savings	kg CO_2e per sq. m. per year	7.7	

3. Energy savings, which include electricity (USD0.09 per square meter) and natural gas (USD0.12 per square meter), have been included in the analysis along with their GHG emission reduction (7.7 kilograms of Carbon Dioxide equivalent, kgCO_2e per square meter) based on the IPCU study[2] of 25 completed school buildings. The average annual savings are around USD60,000 and USD122,000, respectively. GHG emission reduction has been monetized by the 'low' shadow prices, according to the Policy and Strategy Note 2018 No. 1, Shadow Carbon Pricing in the Economic Evaluation of AIIB Projects.

[2] Ibid.

Table 2: Estimated Economics Costs and Benefits (USD)

Year	Capital Investment	Operations and Maintenance Expenditure	Energy Savings	GHG Emission Reduction Benefits	Benefits from Avoided Loss of Lives and Damages to Buildings	Net Benefits (Loss)
1	2,794,000	660,000	-	-	-	-3,454,000
2	20,394,000	13,815,556	33,230	54,208	23,831,926	-10,290,192
3	67,859,000	20,393,333	49,845	83,160	35,747,889	-52,371,440
4	61,352,500	26,313,333	64,799	110,510	46,472,255	-41,018,269
5	9,300,500	26,971,111	66,460	115,808	47,663,851	11,574,509
6	-	23,911,111	66,460	118,272	47,663,851	23,937,473
7	-	23,911,111	66,460	120,736	47,663,851	23,939,937
8	-	23,911,111	66,460	123,200	47,663,851	23,942,401
9	-	23,911,111	66,460	125,664	47,663,851	23,944,865
10	-	23,911,111	66,460	128,128	47,663,851	23,947,329
11	-	23,911,111	66,460	130,592	47,663,851	23,949,793
12	-	23,911,111	66,460	135,520	47,663,851	23,954,721
13	-	23,911,111	66,460	137,984	47,663,851	23,957,185
14	-	23,911,111	66,460	140,448	47,663,851	23,959,649
15	-	23,911,111	66,460	142,912	47,663,851	23,962,113
16	-	23,911,111	66,460	147,840	47,663,851	23,967,041
17	-	23,911,111	66,460	150,304	47,663,851	23,969,505
18	-	23,911,111	66,460	155,232	47,663,851	23,974,433
19	-	23,911,111	66,460	157,696	47,663,851	23,976,897
20	-	23,911,111	66,460	160,160	47,663,851	23,979,361
Total	161,700,000	446,820,000	1,211,238	2,438,374	868,673,691	263,803,304

4. Based on available data and the assumptions adopted, the estimated EIRR for the Project is 16 percent per annum and an ENPV of USD40 million, comparable to the original ISMEP project estimates of 17.8 percent and USD55 million, respectively. A Social Discount Rate (SDR) of 10 percent per year used in the ISMEP Project analysis is also adopted here. However, it should be noted that a long-term growth rate of GDP per capita or its proxy, such as an annual average growth of real GDP per capita, can also be used as the SDR. According to the World Bank data portal, the annual average real GDP per capita growth of Türkiye from 1961-2021 was 2.9 percent. Therefore, using the SDR of 10 percent is a very conservative assumption.

5. A sensitivity analysis has been carried out for a 20 percent increase in construction costs, resulting in an EIRR of 12 percent, which is still higher than SDR, and a positive ENPV of about USD17 million. Based on the OECD Education at a Glance 2022 report, the average annual increase in teacher salaries in Türkiye during 2010–2021 was around 1.05 percent. Since salaries account for 95 percent of the total operating expenses, the sensitivity analysis is based on tripling the historical annual salary growth to 3.15 percent, yielding an EIRR of 12 percent and ENPV of about USD12 million.

Table 3: Sensitivity Analysis

Sensitivity Analysis	Base Case	20% Increase in capital investment	3.15% annual increase in salary
Discount Rate	**10%**		
EIRR	16%	12%	12%

6. **Financial Analysis**. Because K–12 public education in Türkiye is free, a financial analysis for the Project is not applicable. However, the lessons from the ISMEP project show significant operational cost savings from incorporating energy and resource efficiency into the Project's technical design. Instead, the financial analysis focused on savings in operational costs based on analyzing 25 completed school buildings. For reconstructed and retrofitted schools, the data showed a reduction in total operational costs, consisting of electricity, natural gas and water bills, of 30.5 percent and 24 percent, respectively. Replacement and maintenance of materials over the life of the structures were not considered. The schools achieved an average annual total operational cost per square meter of USD0.26 after reconstruction and USD0.15 after retrofitting. Applying the same assumptions to the Project's targeted facilities results in the summary of expected combined operational cost savings of around USD48,000 per year under the Project.

Annex 4: Member and Sector Context

1. Despite the adverse impact of COVID-19 Pandemic, the average annual Gross Domestic Products (GDP) of Türkiye during 2011-2020 was 5.2 percent, 1.2 and 1.4 percent higher than in the previous two decades[3]. The latest GDP growth registered impressive 11.4 percent in 2021 during the peak of COVID-19 pandemic. However, the GDP growth has been achieved through high growth of credits and monetary stimulus which has resulted in rapid increase in inflation and deterioration of the value of domestic currency Turkish lira. Furthermore, the food and commodity supply shocks due to the geopolitical tensions in early 2022 has exacerbated the increase in the price level and further depreciation of the lira.

2. 70 percent of Türkiye's population are living in either the first- or second-degree seismic risk zones. It has been clearly documented that earthquakes lead to a significant risk to lives, livelihoods, infrastructure, and other assets, and can severely disrupt the Turkish economy. A single 200-year earthquake around Istanbul, 15.84 million inhabitants, produces 30.4 percent of GDP[4], and collects 40 percent of the country's taxes as its largest city, could push half a million people into poverty[5].

3. In addition, many communities have increasingly experienced floods and extreme weather events. For example, there were 935 extreme events recorded in 2019 alone. These events were mainly due to heavy rains/floods, windstorms, snow and hail[6]. Increasing, it has been observed that climate related disasters have occurred with greater intensity and frequency, over the last 20 years. Moving forward, climate models predict this trend will continue with increasing irregularities in precipitation patterns with more frequent extreme rain in shorter time interval leading to heavy flood, as well as prolonged drought and wildfires, and sea-level rise. Long-term average annual losses due to natural disasters in Türkiye are estimated at USD 711 million a year for earthquakes and USD 843 million for floods. Together, these hazards could result in up to US$1.6 billion in losses annually[7].

4. The 2023 strong earthquake of 7.8 and 7.5 magnitude in the eleven southern provinces and the 2021 catastrophic flood in the Black Sea region have once again highlighted how much Türkiye is vulnerable to the seismic and climate risks. The overall impact of the recent earthquake is estimated to be around USD 103.6 billion which is equivalent to 9 percent[8] of the projected GDP for 2023. The 2023 earthquake has also prompted the Government of Türkiye to accelerate the country-wide program of retrofitting and reconstruction of old public buildings that were build prior to 1999 to meet the current seismic resilient standard. The Governorate of Istanbul has

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[3] *Op. cit*. Computed by the author using the data from the World Bank Data Portal
[4] Turkish Statistical Institute, data portal, https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2021-45619&dil=2
[5] World Bank, 2021, Overlooked. Examining the impact of disasters and climate shocks on poverty in Europe and Central Asia.
[6] 2019 was recorded as the year with the highest number of hydrometeorological disasters and floods occurred between 1944-2019. Turkish State Meteorological service (2020). State of the Climate in Türkiye in 2019 https://www.mgm.gov.tr/FILES/genel/kitaplar/2019MeteorolojikAfetlerDegerlendirmesi.pdf
[7] World Bank, 2020. Turkey, Understanding Disaster and Climate Impacts on the Poorest and Most Vulnerable.
[8] *Op. cit*. Presidency of Strategy and Budget, April 2023

identified the last group of old school buildings that were built before 1999 and needs to be either retrofitted or reconstructed as early as possible in order to reduce their vulnerability against future seismic activities in Istanbul.

5. Istanbul, one the largest metropolitan in the world with 15.84 million residents and accounted for more than 30 percent of the country GDP, in 2021[9]. Therefore, the sustainable development and growth of the City is a critical part of the country strategic development pathway. At the same time, Istanbul has also been highly vulnerable to the seismic and climate change risks. After the Marmara earthquake in 1999, the Government of Türkiye enhanced its efforts to develop and implement a comprehensive hazard risk management strategy for the country. At the local level in Istanbul, both the municipality and the provincial governorship demonstrated commitment to seismic risk mitigation and implemented risk assessment and planning activities leading to the Earthquake Master Plan for Istanbul. This has been internationally recognized as a strategic instrument for addressing seismic risk in a highly vulnerable mega-city. In addition, the Government invested in the revision and updating of the building code in 2000 and 2007.

6. Furthermore, Istanbul has completed the Climate Change Action Plan on both mitigation and adaptation. On the Mitigation, the Action Plan aimed to reduce the GHG emissions by 33 percent by 2030 mainly through energy efficiency measures in various sectors and waste-to-energy programs. On the adaptation, the Action Plan focused on reducing disaster risks and recovery periods especially ecosystems, infrastructures and socioeconomic systems, and strengthening the most vulnerable elements of these identified system[10].

7. Türkiye is among the countries most affected by earthquakes due to its geographical location and tectonic, seismic, and topographic conditions. The country population and economy are highly exposed and vulnerable to seismic activities. The impacts of earthquake disasters have been on a rising trend as Türkiye urbanization rate and population growth. The Table A5-1 below lists main data of recent earthquakes in Türkiye[11].

Earthquakes	Magnitude (Richter)	Loss of Life and Damage
1966 Varto Earthquake	6.9	2,396 people dead; Around 20,007 buildings damaged
1970- Gediz Earthquake	7.2	1,086 people dead; Around 19,291 buildings damaged
1975 Lice Earthquake	6.6	2,385 people dead; Around 8,149 buildings damaged

[9] *Op. cit.* Turkish Statistical Institute, data portal
[10] *Op. cit.* Istanbul Governorate, 2018
[11] School of Public Health, Université catholique de Louvain, The International Disaster Database, https://www.emdat.be/

Earthquakes	Magnitude (Richter)	Loss of Life and Damage
1983 Erzurum Earthquake	6.6	1,155 people dead; Around 3,241 buildings damaged
1992 Erzincan Earthquake	6.6	653 people dead; Around 8,057 buildings damaged
1995 Dinar Earthquake	6.2	94 people dead; Around 14,156 buildings damaged
1998 Adana Ceyhan Earthquake	6.3	145 people dead; Around 31,463 buildings damaged
1999 Marmara Earthquakes	7.6 and 7.1	18,000 people dead; 90,593 buildings and 319,000 housing units damaged1
2003 Bingöl Earthquake		177 people dead and around 500 people injured Around 7,800 buildings damaged, and 6,000 housing units damaged
2011- Van Earthquakes	7.1	644 people dead and 1,966 people injured1
2020-Elazig Earthquake	6.8	41 people dead and 1,466 people injured; Around 1,965 buildings damaged1
2020- Aegean Earthquake (Izmir)	6.6	117 people dead; Around 506 buildings damaged
2023 Southern Provinces Earthquakes[12]	7.7 and 7.6	48,448 people dead; 3.3 million people have been displaced;

[12] *Op. cit*. Presidency of Strategy and Budget, April 2023

Annex 5: Sovereign Credit Fact Sheet

1. Background. Türkiye is an upper-middle-income country with income per capita of around USD10,000 (or around USD37,000 in purchasing power parity) and a population of around 85 million. Türkiye is a large, diversified, dynamic and business-oriented economy. Since early 2000s, it enjoyed robust growth, around 5.5 percent per year on average, underpinned initially by a strong focus on development, macroeconomic stability, strong fiscal frameworks, trade openness and institutional reform. During this time, income per capita has tripled, poverty fell from 42 to 13 percent (as of 2019).

2. However, in the past few years, economic situation has become more volatile, and Türkiye's sovereign credit ratings slid below investment grade, factors behind which include increased reliance on short-term stimulus via expansionary fiscal, monetary and credit policies, occasional employment of unorthodox policies, declining fiscal buffers, high dependence on external finance (and hence, vulnerability to market sentiment), perceived erosion of institutional checks and balances, as well as rising geopolitical risks—according to rating agencies. IMF estimates that potential growth has declined to around 3 percent.

Selected economic indicators 1/	**2019**	**2020**	**2021**	**2022**	**2023 ***	**2024 ***	**2025 ***
GDP growth 2/	0.8	1.9	11.4	5.6	2.7	3.6	3.0
Inflation 2/	15.2	12.3	19.6	72.3	50.6	35.2	24.9
Fiscal balance 3/	-4.8	-5.1	-4.0	-1.6	-6.5	-5.7	-5.6
Gross public debt	32.6	39.7	41.8	31.7	37.7	39.6	42.2
Gross public financing needs	8.4	10.5	12.1	12.9	13.3	13.5	13.8
Current account balance	1.4	-4.4	-0.9	-5.3	-3.9	-3.2	-2.5
Gross external debt 4/	54.5	59.8	54.2	50.7	..	..	
Gross external financing needs	22.3	29.4	27.6	25.9	24.2	23.0	21.6
Gross FX reserves (USD billion) 4/	105.7	93.6	111.2	128.7	121.4	..	..
Exchange rate (TRY/USD) 4/	5.9	7.3	13.0	18.7	20.9	..	..

Sources: IMF World Economic Outlook April 2023; Country Report No. 21/110; central bank

Notes: 1/ In percent of GDP, except where noted; figures for 2022-25 are estimates and projections; 2/ Percent change, year-on-year; average; 3/ Nonfinancial public sector, IMF definition (excluding one-off items); 4/ most recent data from the CBRT, TRY=Turkish lira, end-of-period, for 2023: as of end-May.

3. Recent Developments**.** In response to the pandemic, the authorities implemented a sizeable response, worth over 12 percent of GDP, one of the largest among emerging markets. The result was a remarkable and swift turnaround—a 11.4 percent rebound in 2021 despite marginally positive growth in 2020. Thanks to spending restraint, the fiscal deficit did not deteriorate.

4. Nonetheless, the past two years have been marked by financial volatility and macroeconomic stress. According to observers, authorities have been pushing for maximum growth despite macro-financial vulnerabilities, with policies perceived by investors as unorthodox. In a typical cycle, expansionary policies (e.g., large credit expansion) or an external shock, or both, would lead to higher current account deficit, higher inflation, and negative real interest rates. This would in turn put pressure on the currency (with occasional sharp depreciations), drain international reserves and lead to market anxiety and potential credit downgrades. This could be followed by further policy changes to restore confidence.

5. Between September 2021 and February 2023, and before the recent hikes in June 2023, the central bank has adopted monetary easing policy and cumulatively cut the policy rate by 1050 bps while tightening monetary policies have been globally observed as a common measure to curb high and accelerating inflation. Authorities' resolve to persevere with monetary easing has led to capital outflows and a sharp depreciation. As a result, the currency has lost more than half of its value, while average annual inflation has risen sharply to over 70 percent in 2022. Over that period, a host of policies have been put in place to stem depreciation, promote "lira-ization" and control credit in the economy.

6. Additionally, the war in Ukraine is having significant negative spillovers, via higher energy and food prices and higher risk premia. The energy import bill has almost doubled, and the current account deficit has increased sharply in 2022 to 5.3 percent of GDP, despite a record tourism season and solid export performance. The slow-down in export markets in Europe has started to weigh the trade balance and growth.

7. The earthquakes in early February 2023, though affecting 16 percent of the population, will have limited impact on the economic growth as the affected areas account for around 9 percent of GDP and 10 percent of industrial value-added. The reconstruction impact will largely materialize in the same calendar year, offsetting the negative impact of the earthquake related disruptions on GDP. It is estimated that the earthquakes will reduce the GDP growth by 0.6 percentage point in 2023.

8. Outlook and Risks**.** The outlook is characterized by high uncertainty. Key unknowns relate to the deteriorating external liquidity situation, the volatile market sentiment, the durability of the recent improvements in macroeconomic policy, and the impact of geopolitical tensions.

9. According to the IMF, the economy has been estimated to grow at a still high 5.6 percent in 2022 and will revert to the medium-term potential of 3.0 percent. The boost to exports from depreciation is gradually being eroded by cost inflation and slower growth in trade partners. Off-balance sheet fiscal risks are rising, particularly the cost of guaranteed compensation to depositors for exchange rate losses and financing the difference between cost of imported energy and price charged to households and small enterprises amounted to more than 1.2 percent of GDP in 2022. The continued depreciation of currency after the elections will further increase the government liabilities under such schemes. Inflation seems to have peaked and is expected to decline in 2023 to around 50 percent. However, it is at risk of becoming entrenched at levels significantly above the central bank's target.

10. Since July 2022, all three major rating agencies have downgraded Türkiye's sovereign credit—to B negative (S&P), B negative (Fitch) and B3 stable (Moody's)—citing high external gross financing needs (including because of high current account deficit), rather modest reserves in relation to these needs, unorthodox monetary policies, and government's revealed preference for growth over macro stability—which all combine to reduce confidence, breed uncertainty, expose Türkiye to volatile market sentiment and increase risks to financial stability. The tight global monetary conditions present a risk.

11. The re-election of the current government provided an opportunity to reverse some of the adverse macroeconomic policy measures of the past. Since June 2023, the Central bank of the Republic of Türkiye increased policy rate by 1650bps and announced a simplification in macroprudential policies to provide better predictability for the future and improve confidence in the market. Going forward, the government should focus on structural reforms to reduce vulnerabilities and shift the sources of growth to private sector. The reforms should focus on improving business and regulatory environment, human capital, and female labor force participation. It will help increase exports in a sustainable manner and build foreign reserves to support "lira-ization" while reducing the fiscal and current account deficits.

12. The private sector has demonstrated resilience and has considerable experience in navigating through the volatile environment despite the recent economic challenges. While leverage in the corporate sector remains high, it has come down recently. Large firms report sufficient liquidity, positive short-term net open FX positions and significant natural FX hedges. Regarding the banking sector, despite the pandemic and the large depreciation, reported capitalization remains adequate and non-performing loans are low. This reflects resilience, but also, partially, the legacy forbearance measures, high credit growth, inflation, the recapitalization of state banks and some loan restructuring. Also, despite sector's dependence on wholesale FX funding and short-term FX deposit, domestic banks have been able to continue to tap their robust banking relationships and roll over obligations even amid high market uncertainty. Reported liquidity and profitability metrics are adequate. Ultimately, the system hinges on residents' confidence and willingness to keep their sizeable dollars deposits in domestic banks, which so far has been sustained.

13. According to the IMF, public debt is generally low and sustainable, even if vulnerabilities have been rising. After dipping in 2022 on account of high inflation, debt is expected to increase over the medium term to around 40 percent of GDP. On the other hand, rating agencies expect debt to stabilize at lower levels, around 35 percent of GDP. Overall, government's relatively strong balance sheet and uninterrupted access to financial markets allay sustainability concerns. Key strengths anchoring Türkiye's longer-term debt sustainability include a track record of conservative fiscal policies, as well as a large, diversified economy with young population and entrepreneurial spirit which translate into substantial growth potential. Likewise, Türkiye's external debt is expected to remain sustainable over the medium term and should decline to below 50 percent of GDP along some expected real exchange rate appreciation.