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Report No: PAD00208

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED GRANT

IN THE AMOUNT OF SDR258.1 MILLION
(US$350 MILLION EQUIVALENT)

TO THE

REPUBLIC OF TAJIKISTAN

FOR A

SUSTAINABLE FINANCING FOR ROGUN HYDROPOWER PROJECT

AS PHASE 1 OF THE MULTI-PHASE PROGRAMMATIC APPROACH
OF THE ROGUN HYDROPOWER PROGRAM

WITH AN OVERALL FINANCING ENVELOPE OF US$650 MILLION EQUIVALENT
November 19, 2024

Energy and Extractives Global Practice
Europe and Central Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2024)

Currency Unit =	TJS
TJS10.654 =	US$1
US$1.356 =	SDR 1

FISCAL YEAR
January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

ACG	Arab Coordination Group
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AM	Accountability Mechanism
AOI	Area of influence
BCM	Billion Cubic Meters
BMP	Biodiversity Management Plan
BSP	Benefit Sharing Program
BT	Barqi Tojik Open Joint Stock Company
CA	Central Asia
CAPS	Central Asian Power System
CASA	Central Asia – South Asia Power Transmission and Trade Project
CAWEP	Central Asia Water and Energy Program
CCAP	Climate Change Action Plan
CCGT	Combined Cycle Gas Turbine
CHMP	Cultural Heritage Management Plan
CE	Citizen Engagement
CO2	Carbon Dioxide
CPF	Country Partnership Framework
CRI	Corporate Results Indicator
CSO	Community Service Organization
DFZ	Directorate of the Flooding Zone
DSA	Debt Sustainability Analysis
DP	Development Partners
DSPOE	Dam Safety Panel of Experts
DT	Diversion Tunnel
EBITDA	Earnings before interest, taxes, depreciation, and amortization
E&S	Environmental and Social
ECA	Export Credit Agency
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
EPC	Engineering, Procurement, and Construction
EPP	Emergency Preparation Plan
ER	Employers Representative
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environmental, Social, Health, and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESPOE	Environmental and Social Panel of Experts
ESS	Environmental and Social Standard
FDI	Foreign Direct Investment
FIDIC	Fédération Internationale Des Ingénieurs-Conseils
FM	Financial Management
FMM	Financial Management Manual
FSL	Full Supply Level
FY	Fiscal year (refers to the World Bank Group fiscal year July 1-June 30)
ICWC	Interstate Commission for Water Coordination
GAP	Gender Action Plan
GBV	Gender Based Violence

GBAO	Gorno-Badakhshan Autonomous Oblast
GCP	Global Challenge Program
GDP	Gross National Product
GNI	Gross National Income
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GWh	Gigawatt-hour
HEIS	Hands on enhanced implementation support
HPP	Hydropower Plant
HV	High Voltage
IDA	International Development Association
IFAS	International Fund to Save the Aral Sea
IMF	International Monetary Fund
LDP	Letter of Development Policy
LMP	Labor Management Plan
LRP	Livelihood Restoration Plan
masl	Meters Above Sea Level
M&E	Monitoring and Evaluation
MEWR	Ministry of Energy and Water Resources
MOF	Ministry of Finance
MOU	Memorandum of Understanding
MW	Megawatt
NDC	Nationally Determined Contributions
NDS	National Development Strategy
NGO	Non-Governmental Organization
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development
OHS	Operational Health and Safety
OIP	Overall Implementation Plan
OJSC	Open Joint Stock Company
O&M	Operation and Maintenance
OP	Operational Policy
PAP	Project Affected People
PDO	Project Development Objective
PIA	Project Implementation Agreement
PMC	Project Management Consultant
PMF	Probable Maximum Flood
PMG	Project Management Group
POE	Panel of Experts
PPA	Power Purchase Agreement
PPSD	Project Procurement Strategy for Development
PUFR	Power Utility Financial Recovery
PV	Photovoltaic
QA/QC	Quality Audit and Quality Control
RAP	Resettlement Action Plan
RLRF	Resettlement and Livelihood Restoration Management Framework
RCG	Rogun Coordination Group
SEP	Stakeholder Engagement Plan
SDR	Special Drawing Right
SEA/SH	Sexual Exploitation and Abuse / Sexual Harassment
SIB	Shabakahoi Intiqoli Barq Joint Stock Company

SOE	State Owned Enterprise
STB	Shabakahoi Taqsimoti Barq Joint Stock Company
TA	Technical Assistance
TALCO	Tajikistan Aluminium Company
TEAS	Techno-Economic Assessment Studies
TGEM	TajikGidroElectroMontaj
TJS	Tajik Somoni
TSA	Targeted Social Assistance
TWh	Terawatt-hour
WB	World Bank

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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Tajikistan	Sustainable Financing for Rogun Hydropower Project		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P181029	Investment Project Financing (IPF)	High	

Financing & Implementation Modalities

[✓] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternative Procurement Arrangements (APA)	[✓] Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date	Expected Program Closing Date
17-Dec-2024	30-Jun-2029	31-Dec-2035
Bank/IFC Collaboration		
No		

MPA Program Development Objective

To increase supply of clean, affordable and climate resilient hydroelectricity for consumers in Tajikistan and the Central Asia region.

MPA FINANCING DATA (US$, Millions)

MPA Program Financing Envelope	6,290.00

Components

Component Name	Cost (US$)
Component 1: Construction activities	3,026,000,000.00
Component 2: Project implementation support	178,000,000.00
Component 3: RAP and LRP implementation	178,000,000.00
Component 4: Hydro meteorological activities	5,000,000.00

Organizations

Borrower:	Republic of Tajikistan
Implementing Agency:	Rogun HPP Open Joint Stock Company, including through Rogun Project Management Group for the Power Plant Construction under the President of the Republic, and the Directorate of the Flooding Zone

MPA FINANCING DETAILS (US$, Millions)

MPA Program Financing Envelope:	6,290.00
of which Bank Financing (IBRD):	0.00
of which Bank Financing (IDA):	650.00
of which Other Financing sources:	5,640.00

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)?	No
Is this project Private Capital Enabling (PCE)?	No

SUMMARY

Total Operation Cost	**6,290.00**
Total Financing	**6,290.00**
of which IBRD/IDA	**350.00**

Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Development Association (IDA)	350.00
IDA Grant	350.00

Non-World Bank Group Financing

Counterpart Funding	3,390.00
Borrowing Agency	1,250.00
Borrower/Recipient	2,140.00
Other Sources	2,550.00
OPEC FUND	100.00
KUWAIT: Kuwait Fund for Arab Economic Development	100.00
ABU DHABI: Abu Dhabi Fund for Arab Economic Development	100.00
SAUDI ARABIA: Saudi Fund for Development	100.00
Asian Infrastructure Investment Bank	500.00
Islamic Development Bank	150.00
EC: European Investment Bank	550.00
Asian Development Bank	500.00
Bilateral Agencies (unidentified)	450.00

IDA Resources (US$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
Regional	0.00	163.00	0.00	0.00	163.00
National Performance-Based Allocations (PBA)	0.00	187.00	0.00	0.00	187.00

Total	**0.00**	**350.00**	**0.00**	**0.00**	**350.00**

Expected Disbursements (US$, Millions)

WB Fiscal Year	2025	2026	2027	2028	2029
Annual	40.83	90.00	90.00	90.00	39.17
Cumulative	40.83	130.83	220.83	310.83	350.00

PRACTICE AREA(S)

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	High
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	High
7. Environment and Social	High
8. Stakeholders	Substantial
9. Overall	High
Overall MPA Program Risk	High

POLICY COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description
Schedule 2, Section I.A.2 Throughout the period of implementation of the Project, the Recipient shall cause DFZ to maintain a team acceptable to the Association with functions, resources, and staff in adequate numbers and with qualifications, experience, and terms of reference satisfactory to the Association.
Schedule 2, Section I.A.3 The Recipient shall cause Rogun OJSC, through Rogun PMG, to maintain and convene regularly throughout the period of Project implementation until two (2) years after the filling of the reservoir to the full supply level and commissioning of the Rogun HPP, an Environmental and Social Panel of Experts ("ESPOE") in form and with terms of reference, composition, qualifications, and resources satisfactory to the Association to review and advise on all environmental and social aspects of the Project.
Schedule 2, Section I.A.5 The Recipient shall cause Rogun OJSC, through Rogun PMG, to maintain and convene regularly throughout the period of Project implementation until two (2) years after the filling of the reservoir to the full supply level and commissioning of the Rogun HPP, the Dam Safety Panel of Experts ("DSPOE") in form and with terms of reference, composition, qualifications, and resources satisfactory to the Association, to provide just-in-time advice on construction-related matters of the Rogun HPP.
Schedule 2, Section I.A.7 No later than three (3) months after the Effective Date, the Recipient shall cause Rogun OJSC, through Rogun PMG, to engage, and thereafter maintain throughout the period of Project implementation, a PMC with terms of reference acceptable to the Association to, inter alia: (a) manage the construction contracts; and (b) provide management and review services with respect to the Project, including appointed design engineers.
Schedule 2, Section I.B.1 No later than seven (7) months after the Effective Date, the Recipient shall: (a) adopt the BSP Implementation Mechanism; and (b) thereafter, implement the BSP in accordance with said BSP Implementation Mechanism, including maintaining the Benefit Sharing Fund, adequate implementation capacity, conducting a regular audit, and complying with the disclosure requirements about revenues and expenditures of the BSP; all in a manner satisfactory to the Association.
Schedule 2, Section I.B.2 The Recipient shall cause Rogun OJSC to: (i) maintain, at all times, the Project Revenues Account; (ii) allocate every year 3% of the previous calendar year's Project Revenues, increasing to 4% of annual Project Revenues from completion of construction of the dam at a height of 1,185 masl and to 5% of annual Project Revenues from completion of construction of the Rogun HPP, for purposes of implementation of the BSP; and (iii) transfer the annual allocation to the Benefit Sharing Fund by no later than January 31 of each year in accordance with the BSP Resolution, with the first allocation being made for the last quarter of calendar year 2024 no later than January 31, 2025.
Schedule 2, Section I.C.1 and I.C.2 The Recipient shall maintain and cause Rogun OJSC to update on a quarterly basis, throughout the period of Project implementation, the optimized Overall Implementation Plan ("OIP"), and shall cause the Project Implementing Entities to carry out their Respective Parts of the Project in accordance with said plan.
Schedule 2, Section I.D.2 The Recipient shall provide, and shall cause Rogun OJSC, through Rogun PMG to provide, all relevant information as may be reasonably requested in order for the Association to satisfy itself that the requirements of paragraph 2.3 of Section II of the Procurement Regulations are met. Additionally, in connection with any such contract not financed by the Association which falls under Part 1 of the Project and which has a total price exceeding $1,000,000 equivalent, the Recipient shall cause Rogun OJSC, through Rogun PMG, to: (A) submit to the Association, prior to award or contract amendment thereto, as the case may be, all relevant information regarding such contract or amendment in accordance with the template agreed with the Association; and (B) provide the Association with the opportunity to review the information and share any comments within seven (7) calendar days.

Schedule 2, Section I.D.3 Notwithstanding the requirements of paragraph 10.01.a and 10.01.c of Annex II to the Procurement Regulations, the Recipient shall cause Rogun OJSC, through Rogun PMG, to seek the Association's no objection before agreeing to any extension of the stipulated time for execution of the Contract Agreement 1, and any variation order or contract amendment that increases the contract price set forth in the Contract Amendment No. 2. All other requirements of paragraph 10.01 of Annex II to the Procurement Regulations remain unchanged and shall be fully complied with by the Recipient. Additionally, the Recipient shall cause Rogun OJSC, through Rogun PMG, to seek the Association's no objection before agreeing to any changes to the list of subcontractors in form 7 of annex 8 to the Particular Conditions of Contract and any changes to the list of suppliers and manufacturers in form 8 of annex 8 to the Particular Conditions of Contract.
Schedule 2, Section I.F.1 To facilitate the implementation of the Project, the Recipient, through MoF and MEWR, shall enter into an agreement (the "Project Implementation Agreement") with Rogun PMG, Rogun OJSC, DFZ, and Hydromet under terms and conditions approved by the Association, including: (i) the obligation of Rogun OJSC to promptly disclose on its website up-to-date information regarding Rogun OJSC's operations in the Tajik and English languages, carry out the recurrent transfers of Project Revenues to the Benefit Sharing Fund, secure the appointment of the dispute avoidance/adjudication board under the Contract Agreement 1, and implement the Corporate Governance Action Plan in a manner satisfactory to the Association; (ii) the obligation of MEWR to cause BWO Amudarya Tajikistan Branch to ensure regular sharing of discharge and water level data from the Main Reservoirs in the Vakhsh River basin and water withdrawals at the major monitoring stations/hydroposts within its jurisdiction to the MEWR for further reporting to the BWO Amudarya; and (iii) the obligation of Hydromet to carry out Vakhsh River flow measurement and reporting of hydro meteorological data from selected stations through the National Water Information System in accordance with standards acceptable to the Association, including daily information concerning inflow data of the Rogun HPP.
Schedule 2, Section I.G.1 The Recipient shall make the proceeds of the Financing allocated under Categories (1), (2) and (3) available to Rogun OJSC under a subsidiary agreement between the Recipient and Rogun OJSC, under terms and conditions approved by the Association, including the obligation of Rogun OJSC, through Rogun PMG to: (i) carry out the remedial actions set out in the Independent Assessment of Diversion Tunnels, in accordance with the deadlines for such remedial actions set out therein, unless otherwise agreed to in writing by the Association; and (ii) submit to the Association the final report on the identification of legacy wastes and contaminated lands and thereafter carry out, or cause to be carried out, remedial measures recommended in the report.
Schedule 2, Section I.G.4 The Recipient shall cause Rogun OJSC to enter into an implementation arrangement, satisfactory to the Association, with Rogun PMG to delegate certain implementation functions to Rogun PMG, under terms and conditions approved by the Association, including the obligation of Rogun PMG to install no later than sixty (60) days after the Effective Date, and thereafter maintain throughout the period of Project implementation, an accounting software satisfactory to the Association.
Schedule 2, Section I.H.1 The Recipient shall cause Rogun OJSC to enter into an implementation arrangement, satisfactory to the Association, with Rogun PMG to delegate certain implementation functions to Rogun PMG, under terms and conditions approved by the Association, including the obligation of Rogun PMG to install no later than sixty (60) days after the Effective Date, and thereafter maintain throughout the period of Project implementation, an accounting software satisfactory to the Association.
Schedule 2, Section I.I.1 No later than six (6) months after the Effective Date, the Recipient shall ensure that the Co-financing Agreement between the Recipient and the AIIB has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals thereunder have been fulfilled.
Schedule 2, Section I.I.2 No later than eight (8) months after the Effective Date, the Recipient shall ensure that the following co-financing agreements have been executed and delivered and all conditions precedent to their

effectiveness or to the right of the Recipient to make withdrawals thereunder have been fulfilled: (a) the Co-financing Agreement between the Recipient and the ADB; (b) the Co-financing Agreement between the Recipient and the EIB; and (c) the other Co-financing Agreements being negotiated by the Recipient as of the Signature Date.
Schedule 2, Section I.I.3 No later than twelve (12) months after the Effective Date, the Recipient shall ensure that the following co-financing agreements have been executed and delivered and all conditions precedent to their effectiveness or to the right of the Recipient to make withdrawals thereunder have been fulfilled: (a) the Co-financing Agreement between the Recipient and the ADFD; (b) the Co-financing Agreement between the Recipient and the IsDB; (c) the Co-financing Agreement between the Recipient and the Kuwait Fund; (d) the Co-financing Agreement between the Recipient and the OPEC Fund; and (e) the Co-financing Agreement between the Recipient and the SFD.
Schedule 2, Section IV.A.1 The Recipient shall: (a) no later than November 30, 2024, prepare and adopt the Reservoir Impoundment Plan for 2025 in form and substance acceptable to the Association; (b) thereafter conduct the impoundment of the Rogun Reservoir in accordance with: (i) the master program incorporated in the OIP; and (ii) the Reservoir Impoundment Plan for 2025; and (c) comply at all times with the Regional Water Sharing Arrangements.
Schedule 2, Section IV.A.2 The Recipient shall, promptly upon the Association's request, solicit and furnish to the Association the ESPOE's and DSPOE's assessments and recommendations concerning the environmental and social measures and dam safety measures undertaken or to be undertaken by the Recipient and the Project Implementing Entities before, during, and after any stage of impoundment of the Rogun Reservoir.
Schedule 2, Section IV.A.3 The Recipient shall cause Rogun OJSC to operate Rogun HPP during the Rogun Reservoir impoundment in such a manner that: (i) the Recipient complies at all times with the Regional Water Sharing Arrangements, including observance of the Annual Allocation (meaning using no more than the agreed and otherwise unused Annual Allocation to Tajikistan), and the interim Reservoir Management Rules for the Rogun Reservoir; and (ii) the Recipient does not cause appreciable harm to any of the downstream riparian countries.
Schedule 2, Section IV.B.1 No later than six (6) months after the Effective Date, the Recipient shall amend the Decree of the Government of the Republic of Tajikistan No. 625 dated November 26, 2020 to include Rogun Reservoir in the list of reservoirs for which reservoir management rules are required.
Schedule 2, Section IV.B.2 No later than twelve (12) months after the Effective Date, the Recipient shall cause Rogun OJSC to develop and adopt interim Reservoir Management Rules for the Rogun Reservoir during the construction and impoundment stage in form and substance satisfactory to the Association and in a manner that complies with the national legislation and the provisions of this Agreement.
Schedule 2, Section IV.B.3 No later than thirty-six (36) months after the Effective Date, the Recipient, through MEWR, shall develop the Reservoir Management Rules for the Main Reservoirs in the Vakhsh River basin for adoption upon completion of construction and impoundment of Rogun HPP, in form and substance satisfactory to the Association and in a manner that complies with the national legislation and the provisions of this Agreement.
Schedule 2, Section IV.B.4 The Recipient shall cause Rogun OJSC to operate Rogun HPP during the operational phase once full supply level has been achieved in such a manner that: (i) the Recipient complies at all times with the Regional Water Sharing Arrangements and the Reservoir Management Rules for the Main Reservoirs in the Vakhsh River basin; and (ii) the Recipient does not cause appreciable harm to any of the downstream riparian countries.
Schedule 2, Section IV.C.1 The Recipient shall cause TALCO to repay arrears accumulated towards: (i) BT in accordance with the BT repayment schedule as of June 1, 2024 agreed between BT and TALCO; and (ii) STB in accordance with the STB repayment schedule as of July 9, 2024 agreed between STB and TALCO.
Schedule 2, Section IV.C.2 For each billing cycle as of July 9, 2024, the Recipient shall cause TALCO to pay in full all electricity bill payments due to STB within thirty (30) days of receipt.

Schedule 2, Section IV.C.3 No later than six (6) months after the Effective Date, the Recipient shall cause BT to pay in full all electricity arrears accumulated with Rogun OJSC as of the date of the payment, and thereafter cause BT to pay in full all electricity bills due to Rogun OJSC within forty-five (45) days of receipt.
Schedule 2, Section IV.C.4 The Recipient shall maintain progressive annual increases in end-user electricity tariffs to achieve cost recovery by end of 2027 and maintain cost reflective tariffs thereafter.
Schedule 2, Section IV.C.5 No later than three (3) months after the Effective Date, the Recipient shall adopt a government decree in form and substance acceptable to the Association, and thereafter adhere to its effective implementation throughout the period of Project implementation, mandating the implementation of a five-year performance mechanism for BT, setting forth: (i) key performance indicators for BT management regarding improvements in BT's operational and financial performance, including cost controls; (ii) a monitoring framework to track said indicators; and (iii) an adequate incentive framework to secure the achievement of said indicators.
Schedule 2, Section IV.D.1 The Recipient shall cause TALCO to disclose on its website up-to-date information regarding TALCO's operations, including: (i) annual production and export volumes; (ii) annual electricity consumption (in GWh); (iii) electricity tariff applicable during the relevant billing periods; (iv) audit reports, including financial statements and notes; and (v) the audit reports of TALCO Management Ltd.
Schedule 2, Section IV.D.2 The Recipient, through MEWR, shall disclose on its website up-to-date information related to the operational, commercial, and financial performance of BT, SIB, and STB in accordance with indicators agreed with the Association.
Schedule 2, Section IV.D.3 The Recipient, through MEWR and with the assistance of Hydromet, shall disclose to the public on its website and on a monthly basis average monthly data for each preceding month on: (i) inflow and outflow data of the Rogun HPP; (ii) data on water level and discharge of the Rogun and Nurek Reservoirs; (iii) water withdrawals from the Vakhsh River in Tajikistan measured at the monitoring stations/hydroposts within the jurisdiction of the BWO Amudarya Tajikistan Branch; and (iv) flow data downstream measured at the hydrometeorological station located at the Tigrovaya Balka Nature Reserve.

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Article V, 5.01(a)	The Project Implementation Agreement and the OJSC-PMG Implementation Arrangement have been executed in form and substance acceptable to the Association and all conditions precedent, if any, to their effectiveness have been fulfilled.	IBRD/IDA
Effectiveness	Article V, 5.01(b)	Rogun PMG and DFZ have been staffed with adequate technical, procurement, fiduciary, environmental and social specialists in a	IBRD/IDA

		manner acceptable to the Association and as required by the ESMP.	
Effectiveness	Article V, 5.01(c)	Either: (i) the Employer's Representative Services Contract has been amended in form and substance acceptable to the Association to incorporate the responsibility to monitor the Recipient's compliance with the requirements of the Environmental and Social Standards; or (ii) the PMC Contract has been executed in form and substance acceptable to the Association.	IBRD/IDA
Effectiveness	Article V, 5.01(d)	The Recipient has caused Rogun OJSC to update the Overall Implementation Plan in form and substance satisfactory to the Association.	IBRD/IDA
Effectiveness	Article V, 5.01(e)	(i) The BT PPA has been amended in form and substance acceptable to the Association to incorporate, inter alia, revised pricing; and (ii) each of the Kazakhstan PPA and the Uzbekistan PPA have been executed in form and substance acceptable to the Association.	IBRD/IDA
Effectiveness	Article V, 5.01(f)	The Recipient has approved a Cash Waterfall Decree in form and substance acceptable to the Association.	IBRD/IDA
Effectiveness	Article V, 5.01(g)	The Recipient has: (i) caused the general	IBRD/IDA

		assembly of Rogun OJSC to adopt the BSP Resolution, mandating inter alia: (A) the allocation of 3% of annual Project Revenues to the Benefit Sharing Fund during construction, increasing to 4% of annual Project Revenues from completion of construction of the dam at a height of 1,185 masl and to 5% of annual Project Revenues from completion of construction of the Rogun HPP; (B) the transfer of the pro-rata allocation of 3% of annual Project Revenues earned or received during the period from October 1, 2024 to December 31, 2024 to the Benefit Sharing Fund by no later than January 31, 2025; and (C) the transfer of the annual allocation to the Benefit Sharing Fund by no later than January 31 of each year; and (ii) established the Benefit Sharing Fund through the Government Decree on the Benefit Sharing Fund; all in form and substance acceptable to the Association.	
Effectiveness	Article V, 5.01(h)	The Recipient has: (i) amended the Contract Agreement 1 to define the rights and obligations of Rogun PMG as an additional contracting party; and (ii) launched the procurement process for activities under Part 1.5 of	IBRD/IDA

		the Project; all in a manner acceptable to the Association.	
Effectiveness	Article V, 5.01(i)	The Independent Assessment of Diversion Tunnels has been endorsed by the DSPOE, and the DSPOE's recommendations have been adopted by the Rogun OJSC in form and substance satisfactory to the Association.	IBRD/IDA
Effectiveness	Article V, 5.01(j)	Each of the Existing Project Contracts has been amended in form and substance acceptable to the Association to incorporate, inter alia, the requirements of the Environmental and Social Standards and the ESCP.	IBRD/IDA
Effectiveness	Article V, 5.01(k)	The Recipient has adopted and disclosed: (i) the ESIA; (ii) the ESMP; (iii) the Resettlement Action Plan 2; (iv) the Livelihood Restoration Plan 2; (v) the Security Management Plan; (vi) the Traffic Management Plan; and (vii) guidelines/templates to establish: (A) site-wide rules for occupational health and safety; (B) site-wide rules for emergency response procedures; and (C) site-wide rules for waste management for ongoing construction and operation; all in accordance with the requirements of the ESCP and in form and substance acceptable to the Association.	IBRD/IDA

Effectiveness	Article V, 5.01(l)	DFZ and Rogun OJSC, through Rogun PMG, have established a grievance mechanism for Project workers in accordance with the requirements of the ESCP.	IBRD/IDA
Effectiveness	Article V, 5.01(m)	The Recipient has hired an independent third-party organization or consultant with terms of reference acceptable to the Association to undertake quarterly external RAP (including LRP) monitoring.	IBRD/IDA
Effectiveness	Article V, 5.01(n)	The Recipient has approved a government decree in form and substance satisfactory to the Association that: (i) identifies disconnection procedures for all consumers; (ii) in the event of sustained non-payment of electricity bills over a two-month period, mandates the distribution company to disconnect consumers in accordance with the established procedure; and (iii) introduces an adequate mechanism of last resort to compensate the distribution company for the non-payment by the defaulting consumer.	IBRD/IDA
Effectiveness	Article V, 5.01(o)	(i) The Recipient has approved a government decree to revise the rules of the Electricity Sector Escrow Account to: (A) improve the prioritization, predictability, and	IBRD/IDA

		transparency of cash flows in the electricity sector; and (B) end offsetting practices; and (ii) the Recipient has adopted a government decree to: (A) introduce a cash waterfall mechanism for the BT account; and (B) introduce adequate cost controls for BT; all in form and substance satisfactory to the Association.	
Effectiveness	Article V, 5.01(p)	The Recipient, through MoF, has entered into a debt restructuring agreement with BT, in form and substance satisfactory to the Association, which includes: (i) the conversion of the accumulated penalties and interest payments as of October 1, 2024 into the BT equity; (ii) the deferral of the repayment of BT's debt arising from the subsidiary agreements between MoF and BT as of October 1, 2024 for five (5) years, with repayment to be distributed according to an agreed payment schedule over the subsequent five (5) years after the deferral period ends; and (iii) the revision of the terms of the subsidiary agreements to impose penalties and interest for unpaid debt.	IBRD/IDA
Disbursement	Schedule 2, Section III.B.1(b)(i)	Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made under	IBRD/IDA

		Categories (1), (2), and (3), unless and until the Rogun PMG's FM Manual has been adopted by Rogun PMG in a manner acceptable to the Association.	
Disbursement	Schedule 2, Section III.B.1(b)(ii)	Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made under Categories (1), (2), and (3), unless and until the Cultural Heritage Management Plan and the Biodiversity Management Plan have been adopted and disclosed by Rogun PMG in accordance with the requirements of the ESCP and in form and substance acceptable to the Association.	IBRD/IDA
Disbursement	Schedule 2, Section III.B.1(c)	Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made under Category (4), unless and until the DFZ's FM Manual has been adopted by DFZ in a manner acceptable to the Association.	IBRD/IDA

I. STRATEGIC CONTEXT

A. Regional and Country Context

1. **The Rogun Hydropower Plant Project (HPP) is an export-oriented green energy project, which once completed, will bring significant domestic and regional welfare benefits, contribute to the decarbonization of regional power grids in Central Asia (CA) and potentially transform the Tajik economy.** The proposed US$650 million Multi-Phase Approach (MPA) operation (with Phase 1 for US$350 million) would support the completion of the Rogun HPP, which has been under construction since 2017, and crowd-in US$2.9 billion in grants and concessional funds from ten Development Partners (DPs).[1] With a planned installed generation capacity of 3,780 megawatt (MW)[2], the Rogun HPP is part of the World Bank efforts to help address climate change at scale as envisaged in the World Bank Group Climate Change Action Plan 2021 – 2025 and the Evolution Roadmap. About 70 percent of the energy generated would be exported, thus helping to replace fossil-fired generation in Kazakhstan and Uzbekistan, whose economies have a high fossil fuel intensity, while increasing the resilience of water resources regionally. This financing package would also contribute to a sustainable macro-economic framework, which will help free up space for expenditures in the social and other priority sectors, and to significant spillovers on energy and structural reforms in the broader economy.

2. **As a transformational clean and green domestic and export-oriented energy project, the Rogun HPP will become the main pillar of Tajikistan's electricity system and an anchor for a regional electricity market in CA.** The Rogun HPP will ensure reliable electricity supply to meet growing domestic demand at an affordable cost (among the lowest in the world), help address electricity shortages that have become increasingly recurrent, and enhance energy security in Tajikistan by meeting winter peak demand and tackling the country's seasonal energy deficits. At the regional level, the Rogun HPP will play a crucial role in underpinning the development of a regional electricity market and providing reserve and balancing services conducive to integration of intermittent solar photovoltaic (PV) and wind capacity in CA. According to Bank analysis, electricity demand is set to increase in CA by 40 percent by 2030, and double by 2050 in a net zero scenario. The World Bank is supporting countries in CA to develop a regional electricity market through a complementary MPA on Regional Electricity, Market, Integration and Trade (REMIT - currently under preparation). The purpose of REMIT is to establish market and commercial principles in regional cooperation in CA, including piloting short-term trading and supporting the gradual evolution of the pilot market to a modern market structure with a wide range of market products, such as day-ahead, intraday, and balancing services, over a 2024-2035 timeframe in line with the development timelines of Rogun HPP and Kambarata-1 HPP.[3]

3. **Additionally, the large reservoir of Rogun HPP will improve the resilience of the entire Vakhsh cascade of HPPs**, which account for 95 percent of total hydro generation in Tajikistan, through mitigation of flooding risks.[4] Within the boundary of existing water sharing agreements and arrangements among riparian countries, significant economic benefits will accrue to the region in terms of energy supply, flood mitigation and enhanced reliability of water supply for irrigation and domestic uses. These benefits may be more important in the context of resilience to climate change where the observed impacts on the hydrology, including on downstream riparian water demands, can be mitigated through Rogun's storage and optimized and agreed operating protocols, providing additional protection against floods and droughts.

4. **Through this engagement, the Rogun HPP will also finance priority social needs, and augment the social safety nets in the country**. Specifically, the Government of Tajikistan (GoT) has committed to allocating 3 percent of electricity

[1] World Bank, European Investment Bank (EIB), European Union (EU), Asian Infrastructure Investment Bank (AIIB), Asian Development Bank (ADB), Islamic Development Bank (IsDB), Kuwait Fund, Saudi Fund for Development (SFD), OPEC Fund, Abu Dhabi Fund, and other financial institutions.
[2] Additional technical characteristics provided in Annex 3.
[3] Kambarata-1 HPP: Sustainable and Transformational Energy Program, a project under preparation which is expected to support the development of the Kambarata HPP in the Kyrgz Republic.
[4] The existing Nurek Dam is not designed to withstand the Probable Maximum Flood (the estimated daily Probable Maximum Flood (PMF) is 7,770 cubic meters per second (m3/s) with an instantaneous peak PMF of 8,160 m3/s). This leaves the cascade vulnerable to breach in extreme events. The Rogun dam has been designed to store and convey the PMF helping protect the downstream environment from a breach.

sales to a Benefit-Sharing Program (BSP) during the construction period, and to increase this to 5 percent after the end of construction. The GoT has also issued a decree outlining thirteen principles for the BSP reflecting global best-practice and emphasizing transparency, effectiveness and a participatory approach. The annual allocation to the BSP is expected to be around US$1-3 million 2025-27 and gradually increase thereafter as revenues also increase, reaching over US$30 million annually once the reservoir reaches full supply level (FSL). BSP proceeds are expected to support various priority social needs and would therefore augment Tajikistan's existing social safety net. In addition, the forthcoming Development Policy Operation (DPO) includes measures to expand coverage of the Targeted Social Assistance (TSA) program and achieve universal health care access over time, to adopt a rule-based formula for budgetary allocations to schools to ensure more adequate and equitable resourcing and improved universal service delivery, and to report on budgetary resources received by frontline education and health facilities to enhance transparency in the use of fiscal resources.

5. **The proposed Rogun MPA Program[5] will support the GoT to achieve its development vision of accelerating economic growth, strengthening economic and social resilience to shocks and promoting the financial viability of the energy sector.** The proposed Program is critical to helping the Rogun project materialize in a sustainable manner, convening DPs and ultimately achieving secure and affordable energy in Tajikistan, with broader regional energy and climate resilience benefits. The Rogun HPP has benefited from a multi-donor platform which has been in place since the approval of the Technical Assistance (TA) for Financing Framework for Rogun Hydropower Project (P178819, the Rogun TA Project)[6]. The GoT's progress in improving project's sustainability and in advancing reforms, as well as the Bank's close implementation support, have helped convene other financiers.

6. **Tajikistan's recent economic performance has shown signs of improvement.** Tajikistan experienced strong economic growth and low inflation in 2022-2023, helping to reduce poverty incidence. Real GDP expanded by 8 percent in 2022 and another 8.3 percent in 2023. The average consumer price inflation rate declined from 6.6 percent in 2022 to 3.5 percent in 2023. Tajikistan boasted the lowest inflation rate in the region, which was made possible by the implementation of a prudent monetary policy and a strengthened exchange rate. Tajikistan's current account surplus is estimated to have narrowed in 2023 due to workers' remittances inflows and an increase in imports of electric vehicles. Tajikistan also reduced its overall fiscal deficit and volume of public debt from 2020 to 2023. The fiscal deficit declined from over 3 percent in 2020 to around 1 percent on average in 2021-2023.[7] On the other hand, the adoption of a new tax code had a negative impact on tax revenues, which fell by 1 percent of GDP compared to pre-pandemic levels. Despite this setback, the GoT raised public sector wages and social payments and focused capital investment in energy and transport sectors, particularly the Rogun HPP. The volume of public debt declined from 50.3 percent of GDP in 2020 to about 30 percent estimated for 2023, due to economic growth and the appreciation of the Tajik somoni (TJS).

7. **However, efforts to finance the Rogun HPP domestically have placed significant pressure on public resources and exacerbated the risk of debt distress.** In 2007-2022, the GoT invested about US$3.3 billion on Rogun HPP, or close to 39 percent of its GDP in current US$, which was largely financed through the state budget, thus crowding out other expenditures. To support the financing of the Rogun HPP, the GoT issued a 10-year Eurobond in 2017 in the order of US$500 million, the repayment of which has placed Tajikistan at high risk of debt distress. In addition, difficulties in securing the entire financing package for the project have delayed various important works, thereby creating safety risks for the project, with an impact on the macroeconomic conditions given the size of the Rogun HPP relative to the economy. Consequently, it is important that the financing for the completion of the construction of the Rogun HPP - evaluated at US$6.29 billion - be consistent with a stable macro-economic framework.

[5] For the purposes of the Project Appraisal Document, the term "project" or "Rogun HPP project" are general terms referring to the GoT's overall Rogun HPP project. The term "Program" refers to the remaining scope of works under Rogun HPP to be completed, including all phases of the proposed Multi-Phase Approach (MPA); and the term "Project" refers to Phase 1 of the Program.

[6] Approved in January 2023, US$ 15 million with US$5 million co-financing from the AIIB.

[7] This was achieved through a combination of measures such as expenditure restraint policies, increased DP grants and non-tax revenues.

8. **The project has the potential to be a transformative clean energy initiative if executed and managed within a robust macroeconomic, commercial and sustainability framework.** The financing package consisting of a mix of domestic resources, project revenues from the sale of electricity and US$2.9 billion in concessional funds and grant resources would indeed be consistent with the parameters of the debt sustainability analysis (DSA) developed jointly by the World Bank and the International Monetary Fund (IMF)[8]. The project will operate on a sound commercial footing with the signature of long-term power purchase agreements (PPAs) with Uzbekistan and Kazakhstan, representing more than 70 percent of the energy generated, and another with the domestic offtaker. To strengthen the macroeconomic policy framework, the GoT has also negotiated a new Policy Coordination Instrument (PCI), a non-financing program, with the IMF. The IMF approved the non-funded 22-month PCI program in February 2024. The PCI comprises three pillars, including fiscal policy and debt management, monetary policy and financial sector supervision, and anti-corruption and governance-related structural reforms. IMF is also providing TA programs in several areas, including public finance, state-owned enterprise (SOE) reforms, monetary and exchange rate policies, and national account statistics. In addition, the GoT is committed to a program of reforms to unleash the development potential of Tajikistan, supported by a World Bank financed DPO series, to help promote a more competitive and private sector driven economy, as well as an ongoing Program-for-Results operation to improve the financial viability of the electricity sector[9]. In particular, the GoT has agreed to accelerate its reforms to achieve cost recovery in the electricity sector by 2027, through the establishment of an independent electricity sector operator, restructuring of debts, improving energy companies' governance, financial transparency and efficiency, fostering payment discipline from key end-users and tariff reform.

9. **That said, the success of this project will require enhanced governance and transparency, and dedicated supervision support to manage the substantial environmental, social, financial and fiduciary risks associated with the project stemming from its size and complexity, and the fact that it is a brown-field project.** The role of the Employers Representative (ER) currently focused on dam construction has been expanded to cover all contracts and their coordination, with monthly reporting on implementation progress to DPs, including on E&S aspects. This scope of supervision activities will be expanded through the recruitment of a new Project Management Consultant (PMC) under the project. Furthermore, the GoT agreed to implement a cash waterfall mechanism to allow for a more disciplined, transparent, and effective management of revenues generated from sale of electricity from the project in the domestic market and for exports. The waterfall would follow a structured, rules-based approach, ensuring that the state-owned Rogun Open Joint Stock Company (OJSC) – the owner and operator of the project – does not incur unjustified expenditures. The GoT has also committed to implementing company-level corporate governance improvements for Rogun OJSC to align with good practices identified in the OECD Guidelines on Corporate Governance of State-Owned Enterprises (2015). In addition, the Rogun Project Management Group (PMG) has disclosed on its website[10] all environmental and social (E&S) documents and instruments, together with a summary of all main construction contracts under the project, and has committed to continued transparency through the recurring covenants agreed for the Project. Finally, the GoT has adopted a communication strategy for key stakeholders that emphasizes the project potential to create significant economic benefits for the country and contribute to decarbonization of the Central Asia electricity systems.

B. Sectoral and Institutional Context

10. **There is a growing urgency among CA countries to pursue reforms to promote financially sustainable and creditworthy utilities, which are required to realize the full benefits of regional electricity trade, notably in Uzbekistan, Kazakhstan, and Tajikistan.** In Uzbekistan, energy reforms have been a top priority for the government in the past few years. The latest reforms include a new electricity law, the establishment of an independent energy sector regulator, the unbundling of the power transmission company to separate its transmission and single buyer functions, with the longer-term objective of transitioning towards a competitive market. Reforms are also being pursued in Kazakhstan to promote

[8] Available at https://documents1.worldbank.org/curated/en/099040124151512723/pdf/BOSIB16159e5170f418b23155d4f8be346e.pdf
[9] Power Utility Financial Recovery (PUFR, P168211).
[10] https://energyprojects.tj/index.php/en/publications/1226-transparency-and-d

private sector participation, enhance competition, facilitate access to finance, and promote investments. The Bank, through an extensive program of DPOs, guarantees, investment projects and analytical activities, is supporting both countries in pursuing these reforms. After a pause during COVID-19, the Governments in Uzbekistan and Kazakhstan have recently adjusted electricity tariffs to reach 75 and 85 cost recovery, respectively, with the objective of achieving full-cost recovery by 2026 in both countries. Such reforms in the sub-region help to enhance the Rogun HPP's financial viability by minimizing the off-taker risk associated with PPAs with Uzbekistan and Kazakhstan.

11. **In Tajikistan, the Government is implementing an ambitious reform agenda to improve the financial viability of the electricity sector, which is also crucial for the financial viability of the Rogun HPP.** Tajikistan's electricity sector has been in financial distress for years due to (a) below cost-recovery tariffs; (b) burgeoning debt service obligations and trade payables, and lack of cost controls; (c) operational inefficiencies including high transmission and distribution losses, low collections from strategic customers such as Tajikistan Aluminum Company (TALCO) and water pumping stations; and (d) depreciation of the local currency relative to the US dollar. The following summarizes key achievements in sector reforms to date and the GoT commitments going forward. Some of these reforms are conditions and covenants to this Project, while others are supported by the PUFR under implementation, the forthcoming DPO series, projects supported by other DPs, and were described in detailed in the Letter of Development Policy (LDP) signed by the GoT in February 2024:

(a) ***Tariff reforms*.** Since 2017, the GoT has more than doubled the end-user electricity tariffs. The most recent 16 percent tariff increase across all customer categories became effective on January 1, 2024. The GoT has also committed, as per its updated Program for Financial Recovery of Electricity Sector, to accelerating the transition to cost reflective tariffs achieving cost recovery by 2027, compared to an earlier target of 2031.

(b) ***Electricity market reforms*.** In 2022, the GoT unbundled the vertically integrated Barqi Tojik Open Joint Stock Company (BT), established the new state-owned electricity transmission company (Shabakahoi Intiqoli Barq (SIB) OJSC)) and distribution (Shabakahoi Taqsimoti Barq (STB) OJSC) and hired a management contractor to improve the efficiency of distribution operations. In parallel, the GoT launched an escrow account mechanism to improve the predictability and transparency of electricity sector cash flows and the distribution of revenues to sector companies. Going forward, the GoT is committed to deepening market reforms by: (i) establishing an independent system operator by 2027, after having already moved the system and market operator functions from BT to STB earlier this year; and (ii) enhancing the cash distribution scheme through the escrow account by transitioning to a tariff-based approach rather than a budget-based approach by end-2024.

(c) ***Electricity sector debt restructuring*.** The GoT: (i) reduced the indebtedness of BT by restructuring its debt with the Ministry of Finance (MOF) to reduce the debt burden on BT's balance sheet and converting into equity the penalties for overdue debt service; and (ii) negotiated a significant reduction of the interest rate on BT's commercial debt. Going forward, the electricity companies have committed to avoid incurring any new commercial debt that cannot be serviced using the companies' own operating cash flows, and the GoT has committed to avoid charging penalties to BT for any debt servicing obligations that may not be met before cost-reflective tariffs are achieved.

(d) ***Reduction of electricity losses*.** The GoT embarked on an ambitious loss reduction program with the objective of decreasing the losses from the current average level of about 23 percent. There is an ongoing project supporting large-scale roll-out of advanced metering and billing infrastructure in six large urban centers in Tajikistan, which is financed by ADB, EIB, EU and the European Bank for Reconstruction and Development.

(e) ***Corporate governance reforms*.** The GoT has initiated measures to improve the corporate governance of the sector by establishing supervisory boards for all three companies (BT, SIB and STB), including sub-committees for compensation and audit. Going forward, the GoT will deepen its commitment to good practice corporate governance, including by supporting the appointment of at least two independent members to each supervisory board (including independence from the GoT, as shareholder).

(f) ***Further improvement of electricity payment discipline by the largest consumer (TALCO) and enhanced transparency of its smelter's operations.*** The GoT has committed to a series of measures to improve TALCO's contribution to the electricity sector's financial viability (see Box 1 for details).

12. Sustaining and deepening the reform momentum will be required to achieve the GoT's intent to reach full cost recovery by 2027. Indeed, despite recent reform measures, the financial performance of the electricity sector has deteriorated over the past 12 months. In terms of trade payables, by the end of 2023 BT's past-due liabilities to Rogun OJSC exceeded US$60 million and to Sangtuda 1 & 2 HPPs exceeded US$500 million. Therefore, the Project includes a series of legal conditions and covenants that reflect key actions to put the sector onto a path to financial viability.

Box 1: The Relevance of TALCO for the Rogun HPP Project

As the single largest electricity consumer in Tajikistan, consuming about 12 percent of total electricity in 2023, TALCO plays an important role in the financial viability of the electricity sector. Given the smelter's large share in domestic consumption, it indirectly impacts the Rogun HPP by undermining the ability of BT to remain current on its bill payments to the Rogun HPP (approximately 30 percent of electricity from Rogun HPP is expected to be sold to BT).

TALCO's importance in the electricity sector has been declining in recent years as a result of its deteriorating competitiveness. While in 2009-2013, TALCO accounted for 40-45 percent of total end-user consumption, its electricity consumption started to gradually decline reaching about 12 percent in 2023 of energy produced in Tajikistan. Similarly, consumption in absolute terms fell from 5.5-6.3 billion kWh in 2009-13, to 1.7 billion kWh in 2023. This drop in electricity consumption is matched by a drop in aluminum production which fell from 361,000 tons in 2009 to approximately 65,000 tons in 2023. This reduction in production volumes stemmed from a loss of competitiveness in the global markets, mainly driven by rapid expansion of China's production and exports, which increased by 2.5 times in 2010-2021 reaching 58 percent of global production, reducing international prices.

Going forward, global benchmarking indicates that aluminum production in Tajikistan is at a disadvantage because the business model of the aluminum industry hinges on economies of scale, availability of low-cost inputs (including electricity) and cost-competitive transportation, with the latter being negatively affected by Tajikistan's landlocked status.

The GoT has committed to a series of measures to improve TALCO's contribution to the electricity sector's financial viability:

(a) ***Transition to cost-reflective tariffs.*** As part of the GoT's broader objective to accelerate achievement of electricity sector cost recovery tariffs by 2027, the GoT has increased TALCO tariff by 50 percent in January 2023 and by another 16 percent in January 2024, with the average tariff reaching US$c1.7/kWh, and is committed to further increases.

(b) ***Ensure TALCO electricity bills are fully paid on a timely basis.*** While tariffs have increased, TALCO has been struggling to make timely payments for electricity, accumulating approximately US$39 million in arrears in as of July 31, 2024. The GoT has committed to fully resolving the issue of delayed payments by TALCO, and the company has developed a Repayment Plan to become current on all arrears by 2027, starting from December 2024.

(c) ***Re-evaluate the commercial viability of aluminum production in Tajikistan, and the modality of its subsidization.*** As an input to its long-term industrial policy decisions, the GoT has agreed to carry out an estimate of potential energy efficiency gains for the smelter, which would allow to evaluate options for efficiency improvements. Subsequently, the GoT, through studies under the Rogun TA Project, will assess the long-term commercial viability of aluminum production in Tajikistan.

13. **Furthermore, the GoT has committed to completing the Rogun HPP project following several core sustainability principles, already in place during project preparation.** Those include (i) completion of the project in a macro-fiscally sustainable manner and within the DSA jointly conducted by the IMF and the Bank; (ii) continued strengthening of dam safety, including through the retention of a Dam Safety Panel of Experts (DSPOE); (iii) adherence to robust E&S standards, including through the retention of an Environmental and Social Panel of Experts (ESPOE); (iv) development of a sound commercial framework for the project, including through signature of PPAs with main importing countries (Kazakhstan and Uzbekistan); and (v) managing water flows during construction and operation phases in accordance with existing regional water sharing arrangements (see Box 2). In addition, the GoT has committed to implementing a Rogun BSP (as described in paragraph 4 and Box 3).

14. **These commitments are supported by the ongoing Rogun TA Project** which has contributed to the development/design of key items such as the BSP as well as the implementation of various activities aimed at addressing the above issues. The main achievements supported by the TA Project include: design of the BSP, appointment of DSPOE and ESPOE, update of E&S instruments, update of the overall implementation plan (OIP), preparation of the financing plan, development of the commercial framework for the Project, audit of project quality control and quality assurance systems, independent assessment of diversion tunnels 1-3, additional dam safety studies (additional details on the Rogun TA are provided in Annex 5). The GoT and Rogun PMG have been making solid progress in addressing those issues, and the TA project will continue to provide support in selected areas throughout Rogun HPP project implementation.

Box 2: Transboundary Aspects of Rogun HPP Project

A key transboundary risk is potential impact of the project on water allocation for areas dependent on Vakhsh River flows. Consequently, several key aspects were discussed with riparian countries during consultations with officials, Non-Governmental Organizations (NGOs) and Civil Society Organizations (CSOs), in Almaty, Kazakhstan, on November 8-9, 2023, and in Tashkent, Uzbekistan on October 28, 2024:

- **Water sharing agreements.** A key design principle of the Rogun HPP project is that existing regional water sharing arrangements will be respected during the impoundment and operational phases. Various arrangements have been in place among CA countries including Protocol 566 (adopted in 1987) and Almaty Agreement (signed in 1992) to maintain and adhere to the sharing of the transboundary water resources.
- **Annual allocations and reservoir impoundment.** Historically, Tajikistan has under-used its annual allocation by an estimated average of 1.2 billion cubic meters (bcm) of water. The GoT intends to use this balance to fill the Rogun reservoir, thereby respecting its total annual allocation. The updated reservoir impoundment schedule, updated as part of the OIP, has revised the construction completion date to 2033, but full impoundment is not expected before 2039 due to the application of this constraint reflected in the covenants.
- **Seasonal allocations and annual operation.** Seasonal allocations of water have been developed in line with the allocation decisions agreed to by CA countries. Since the 1970s, the operations of Nurek HPP (downstream from Rogun – see map in Annex 3) have involved shifts from summer flows to winter flows of approximately 4 bcm, allocations which were formalized through the establishment of the Interstate Commission for Water Coordination (ICWC) in 1992. The GoT committed to ensuring that this regime will be maintained during Rogun operational phase, meaning no additional shifts in the existing seasonal flows as a result of the project. The detailed rules for reservoir management and water releases will be in line with this commitment.
- **Central Asia Water and Energy Program (CAWEP).** With DPs support, the Bank is closely involved in strengthening regional dialogue and cooperation on water and energy issues through CAWEP.

The project design will promote compliance with these commitments through several channels:

(a) The Project will finance new hydro-meteorological instrumentation to improve monitoring capabilities and promote data transparency with riparian countries (see description of components for details).
(b) The Project Financing Agreement (FA) and the Environmental and Social Commitment Plan (ESCP) include provisions to assure implementation of these commitments e.g., a recurring Legal Covenant committing the GoT to operate within existing water sharing arrangements including adhering to annual and seasonal allocations within these arrangements.
(c) The PPAs between Rogun HPP and the transmission companies in Uzbekistan and Kazakhstan set out intention for long-term sale of energy from Rogun HPP within summer months under mutually beneficial terms that take into account existing inter-governmental water sharing agreements.

Box 3: GoT Commitment to Implement a BSP

As a key part of the citizen engagement priorities for the project, the BSP will use part of the Rogun HPP project revenues from electricity sale for various economic and social activities, contributing to equitable and sustainable socio-economic development at the local and national levels. The forthcoming DPO series (with the first operation expected to be presented to the Board in FY25) supported the approval of a decree to establish the BSP's legal underpinnings and core principles including:

(i) The proportion of project revenues used for the BSP (expected to be 3 percent of project revenues during construction phase, increasing to 4 percent after the completion of the phase 1 Project and to 5 percent after the end of the construction period).

(ii) The principle to work within existing Government structures to the extent possible (such as the social protection system) to avoid creating parallel structures.
(iii) Mechanisms to ring-fence and protect funds allocated to the BSP and allow for identifiable, attributable outcomes.
(iv) Geographic scope of the BSP (i.e. national).

The BSP is expected to launch in early 2025, with an estimated budget of about US$1-3 million per year in 2025-2027, to increase gradually to US$15 million by 2033 and to over US$30 million by 2039 when FSL is reached and Rogun starts selling significantly more electricity to the domestic market and for exports. The GoT has agreed to commence set asides for the BSP in the last quarter of 2024 and then annually starting in 2025.

15. **There is now urgency to secure coordinated support to the GoT in financing and completing the construction of the project sustainably.** Considering the state budget constraints, the need to strengthen various aspects of the project, and the technical and safety risks to the project from further substantial delay in completion (e.g. sedimentation if the dam height is not increased to 1,110 meters above sea level (masl) within the next few years), the GoT requested financing support for the remaining construction.

16. **The solid implementation progress of the TA Project and the commitment of the GoT to overall electricity sector reforms set the stage for several members of the Rogun Coordination Group (RCG)[11] of development finance institutions to pull together a financing package.** The GoT's financing plan is the following: US$2.14 billion from the state budget, US$1.25 billion in project revenues, and US$2.9 billion in grants and loans from DPs.

17. **This financing package will be complemented by a series of fiscal commitments by the GoT to ensure adequate debt sustainability and sufficient room for social spending.** According to the DSA, and within the strict limits therein, the construction cost and the composition of borrowing for Rogun HPP do not undermine public debt sustainability, anchored by the authorities' commitment to maintain a fiscal deficit of 2.5 percent of GDP over the medium term. In addition, to meet its social obligations, and in line with the IMF PCI, the GoT is committed to containing average budget spending (excluding loans) on Rogun HPP construction within 3-3.5 percent of GDP annually. In line with the ongoing discussions with the GoT, the Bank's financial support to the Rogun HPP is closely linked to progress on the economic reform agenda, which would be supported through a forthcoming DPO series.[12]

18. **The GoT has made good progress in constructing transmission assets required for safe evacuation of electricity from the project and expansion of regional electricity connectivity, which is crucial for the success of the project.** The GoT constructed several high voltage transmission lines and construction is underway for three more, which are expected to be completed in 2025, and which would enable the safe evacuation of the full project capacity (3,780 MW) once construction of the Rogun HPP is completed.

19. **Increased interest in electricity trade within CA has made energy connectivity and trade an important regional agenda for the CA region, and the Rogun HPP will support further strengthening of regional energy markets.** Turkmenistan is currently the main supplier of energy resources in the region, especially during winter. Tajikistan has finalized the resynchronization of its energy system with the Central Asia Power System (CAPS) to enable exports to Kazakhstan and Uzbekistan. The Rogun HPP will also provide Tajikistan with additional room to meet export commitments related to the Central Asia South Asia Electricity Transmission and Trade Project (CASA-1000),[13] which would enable for exports of electricity to Pakistan.

[11] The Rogun Coordination Group is led by the World Bank and includes EU, EIB, AIIB, ADB, Islamic Development Bank, Arab Funds, and other DPs. It is a coordination mechanism to ensure consistency and alignment between DPs on advice provided to the GoT on key issues related to Rogun HPP Project and broader energy sector reforms.

[12] The DPO series aims to support the authorities in their efforts to further open up the economy and make it more inclusive and greener by (i) creating favorable market conditions for private sector development; (ii) strengthening governance in SOEs and public procurement; (iii) addressing gender aspects of economic inclusion; and (iv) building environmental resilience.

[13] The Central Asia South Asia Electricity Transmission and Trade Project (CASA-1000, P145054) supports electricity trade between Central Asia (Tajikistan and Kyrgyzstan) with South Asia (in particular, Afghanistan and Pakistan). It should however be noted that the economic viability of Rogun does not depend on completion of the CASA-1000 project.

20. **The project is expected to have a major impact on direct and indirect job creation during the construction period.** The project has already created a significant number of direct construction jobs and some indirect jobs in the materials and transportation industry in Tajikistan. Most of the construction jobs are local specialized workers and engineers hired by main construction contractors. Moreover, a services industry emerged in the city of Nurek with small enterprises providing hospitality services. Moving forward, job creation is expected to increase further as the financing package is put together and the contractors for other main lots are procured. The recently completed jobs study evaluated the number of direct and indirect jobs to be created under the project during the most active construction period in 2025-2028 to reach around 25,000-30,000 and 30,000-38,000, respectively.

C. Relevance to Higher Level Objectives

21. **The proposed Project is aligned with Tajikistan's National Development Strategy (NDS) 2030**. The GoT is committed to increasing domestic income by up to 3.5 times, reducing poverty by half by 2030, diversifying the electricity supply mix, increasing exports of clean energy and achieving energy security. In the energy sector, the primary objectives are to: (i) increase generation capacity of the hydropower plants to 10,000 MW inclusive of Rogun HPP; (ii) expand non-hydro supply sources (solar and wind) to at least 10 percent of the total supply mix; and (iii) expand electricity exports to at least 10,000 GWh per year.

22. **The proposed Project is fully aligned with the World Bank Group's CPF for Tajikistan,[14] as revised by the Performance and Learning Review (PLR, approved February 1, 2024)**. Specifically, the Project will contribute directly to the achievement of the following CPF objectives:

(a) *CPF Objective 4. Strengthening Institutional Framework and Investment for the Tajik Power Sector*. The Project will support governance strengthening activities at Rogun OJSC.
(b) *CPF Objective 5. Improving Financial Viability of Public Electricity and Water Utilities*. Rogun HPP will provide a long-term source of low-cost energy in Tajikistan, helping solidify the energy sector financial viability.
(c) *CPF Objective 8. Strengthening Regional Connectivity and Integration*. Approximately 70-80 percent of electricity generated by Rogun HPP is expected to be exported.

23. **The proposed Project is aligned with the Energy Global Challenge Program and consistent with the principles of Maximizing Finance for Development**. The proposed Project is aligned with the objective to increase access to affordable, reliable, sustainable, and modern energy by scaling up clean energy, phasing down fossil fuel use, and supporting just transition. Energy provided by the Rogun HPP will help to address one of the key constraints for private sector growth. In particular, energy shortages in winter season currently result in blackouts which hinder the productivity of industry and the overall investment climate. The substantial increase in energy supply from Rogun HPP will alleviate winter shortages and support sustainable private sector investments.

24. **The proposed Project will support Tajikistan, Uzbekistan and Kazakhstan in achieving their Nationally Determined Contributions (NDC) and contribute to climate change mitigation and adaptation efforts, and is consistent with the COP 28 pledge signed by 118 countries to triple renewable energy by 2030.** In the latest NDC (2021) submitted to the United Nations Framework Convention on Climate Change (UNFCCC), Tajikistan committed to a 60-70 percent reduction in emissions by 2030 compared to 1990 levels, conditional on international support and an unconditional emissions reduction target of 50-60 percent by 2030 compared to 1990 levels.[15] The project is also consistent with Tajikistan National Strategy for Adaptation to Climate Change.[16] Specifically, the project would help to expand adaptation in the energy, water, agriculture, forestry, and transportation sectors. In a regional context, the project will support the decarbonization of electricity grids of Kazakhstan and Uzbekistan, enhance energy security and climate resilience, and revive the CA regional electricity market.

[14] Report No. 185087-TJ.
[15] https://unfccc.int/sites/default/files/NDC/2022-06/NDC_TAJIKISTAN_ENG.pdf
[16] https://leap.unep.org/countries/tj/national-legislation/national-strategy-adaptation-climate-change-republic-tajikistan

25. **The proposed Rogun HPP Project is consistent with the World Bank Group Climate Change Action Plan 2021-2025 (CCAP) and Global Challenge Program (GCP) on Energy Access and Transition**. Specifically, the CCAP and GCP recognize the role of hydropower as a clean source of electricity and an enabler to integrate more solar PV and wind generation capacity. Thus, the World Bank will support Tajikistan in developing sustainable and resilient hydropower, while not damaging the ecosystems, and the associated water storage needed, including through regional cooperation to advance complementary investments across countries.

D. Multiphase Programmatic Approach

a) Rationale for using MPA

26. **The MPA is best suited for Rogun HPP financing considering the program scale, complexity and duration**. The use of the MPA is relevant since the Rogun HPP requires sustained financing and technical assistance to undertake longer-term planning, concerted policy reform and regulatory measures, and infrastructure interventions to achieve the desired development outcomes. The proposed MPA will allow a sequenced approach under which financing and technical assistance will be provided over the full duration of the project construction. Specifically, the MPA:

(a) **Responds to GoT's need for long-term support to build institutional knowledge and capacity**. Continuity and momentum are important to ensure smooth implementation. A stop-and-go approach with a standalone IPF would increase the risk of losing the gains achieved through previous investments. Implementation complexity also requires a seamless learning from one phase to the other to capture best-practices and lessons learned. The MPA approach allows appropriate overlapping between phases to ensure continuity in the construction process and avoid implementation delays. Finally, the MPA provides flexibility (assuming that the two planned Program's phases are spread over more than one cycle of the International Development Association (IDA)) to align Tajikistan's national IDA allocation with the scale and duration of support required for Rogun HPP financing.

(b) **Provides a risk-based mitigation approach to implementation, as it enables adaptive management, provides flexibility, and builds institutional capacity to address unforeseen challenges**. The MPA allows the flexibility for course correction while ensuring progress toward the program outcome as laid out in the Theory of Change (Figure 1), hence helping the GoT navigate a complex implementation context.

(c) **Creates the framework for moving toward a longer-term planning process while managing the year-by-year financing cycle and need for active fund-raising**. Over the past years, the GoT has supported the development of Rogun HPP through a short-term and piecemeal approach to financing. Multiyear programming is vital for undertaking complex infrastructure projects in a sustainable manner and to engage the private sector. This MPA directly addresses the need to define longer-term actions and financing needs, with clearly defined outcomes and Results Framework (Annex 1), as well as a robust pipeline.

(d) **Creates a platform for enhancing technical coordination between DPs, Rogun PMG, Rogun OJSC, MOF, Ministry of Energy and Water Resources (MEWR), electricity companies and other relevant authorities**. Strong technical coordination is needed to ensure the successful completion of the Rogun HPP considering its scale for the country. The MPA will provide a key coordination platform and a signal to key stakeholders, including financiers, that the Bank is committed to supporting the Rogun HPP for the long-term under the right conditions. This is strategically relevant to solicit longer duration financing commitments not only from DPs, but also potentially from the private sector and commercial lenders in the later stages of the project.

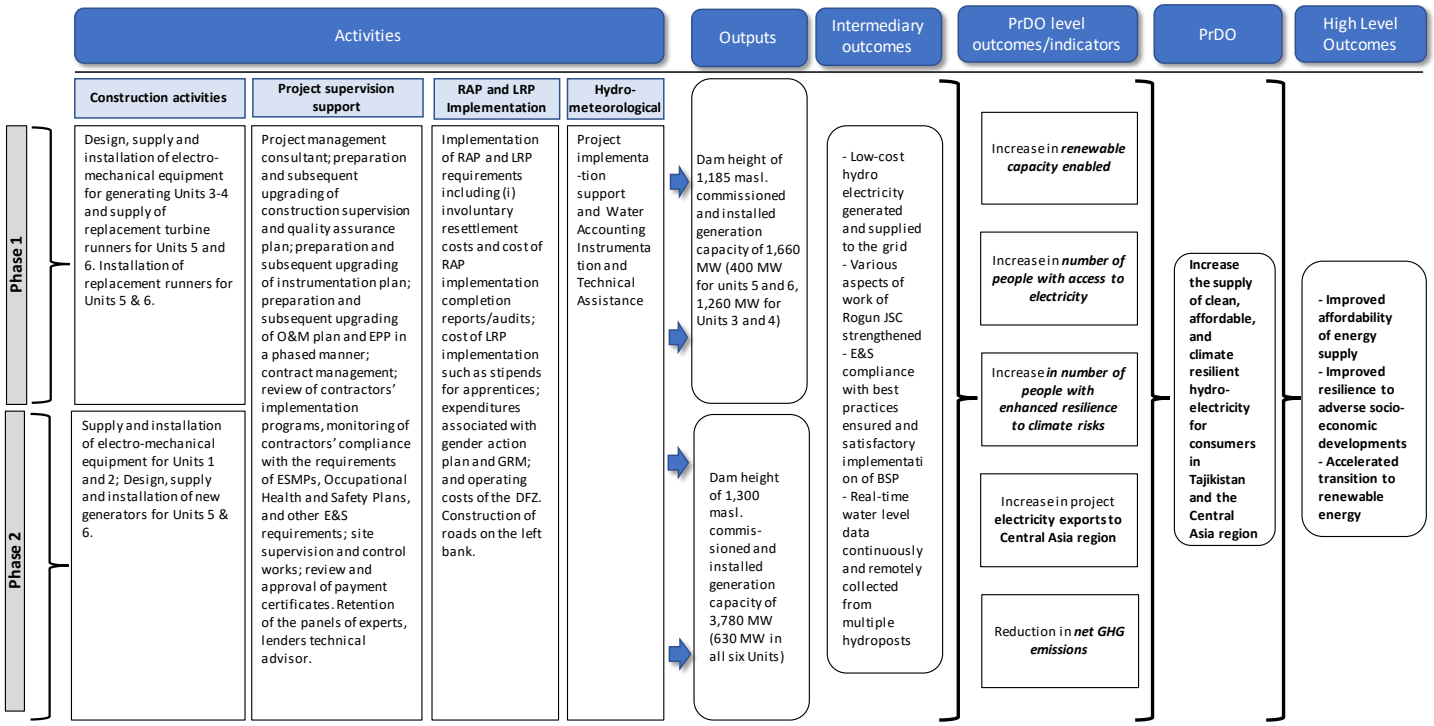
(e) **Allows the current political and financial constraints to be better managed through improved dialogue and a longer-term structured pathway, with well-defined development outcomes.** A structured approach strengthens the development outcomes by aligning individual activities with long-term strategic goals. This not only ensures a more robust Results Framework, but also ensures that each phase effectively builds on lessons learned in other phases. This structured approach to pipeline definition and results reporting also addresses donor requests for

advanced information on future financing needs with clearly defined outcomes. This MPA would also create a positive reinforcement to motivate continued efforts by the electricity sector institutions.

b) Program Results Chain

27. Project activities, outputs, intermediary and long-term outcomes are summarized in Figure 1.

Figure 1: Program Results Chain



c) Program Development Objective (PrDO, all Phases) with Key Program DO Indicators with Baselines and End Targets

28. The PrDO is to increase the supply of clean, affordable, and climate resilient hydroelectricity for consumers in Tajikistan and the Central Asia region. The key Program outcome indicators, which will be measured across all Program phases, include:

(a) **Indicator One (Corporate Results Indicator (CRI)):** Renewable energy capacity enabled (baseline: 0.04 GW; end target 3.78 GW);
(b) **Indicator Two (CRI)**: People with enhanced resilience to climate risks (baseline: 0; end target 9.75 million);
(c) **Indicator Three (CRI)**: People provided with access to electricity (baseline: 0; end target 9.75 million);
(d) **Indicator Four (Custom Indicator)**: Project electricity exports to Central Asia region (baseline: 0; end target: 6,000 GWh);
(e) **Indicator Five (CRI)**: Net GHG emissions reduction per year (baseline: 0 MtCO2/year; end target 3.56 MtCO2/year).

d) Program Framework

29. **The estimated US$6.29 billion to complete the Program is comprised of several main contracts and packages, summarized in Table 1**. The OIP was done applying the fiscally sustainable financing plan, with the plan to complete the project's construction by 2033, with reservoir impoundment up to the FSL of 1,290 masl scheduled to be completed by 2039. The US$6.29 billion cost estimate includes the following contingencies (i) physical contingencies of 21.2 percent

(approximately US$865 million); (ii) 18.2 percent for price adjustments (application of price adjustment formula to existing contracts, approximately US$744 million); and (iii) 14.4 percent contingency for future price adjustment (estimated price adjustments for the remainder of contract duration).[17] In addition to the project cost estimate, the OIP provides updated construction schedule, cashflow requirements and estimates of annual energy generation during project implementation.

Overall Program Scope Cost and Financing

Table 1: Project Financing Structure (million US$ equivalent)

	Estimated financing need	State budget	Project revenues	IDA Grant	ADB Grant & Loan	AIIB Loan	EIB Loan (w/EU guarantee)	ACG loans	Other loans	Total
Component 1 - construction activities										
Lot 1	560			280		280				**560**
Lots 1A & 1B	120			60		60				**120**
Lot 2	2,480	1,310	1,170							**2,480**
Lot 3	280	280								**280**
Lot 3A	1,385			55	500	130	550		150	**1,385**
Lot 4 early works	230	230	0							**230**
Lot 4	550							550		**550**
Control room	15		15							**15**
Component 2 - project implementation support										
Project Management Consultant	170			170						**170**
Employer costs (salaries, offices, design engineer etc.)	130	65	65							**130**
Technical Assistance (Panels of Experts, studies etc.)	30			30						**30**
Component 3 - Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) implementation										
RAP & LRP	300	255		45						**300**
Left bank roads	30					30				**30**
Component 4 - hydro meteorological activities										
Hydro meteorological equipment and TA	10			10						**10**
Total	**6,290**	**2,140**	**1,250**	**650**	**500**	**500**	**550**	**550**	**150**	**6,290**

Source: World Bank team estimate based on OIP (Revision H, March 2024) and expected financing envelopes.
Notes (i) Arab Coordination Group (ACG) includes IsDB (US$150 million), OPEC (US$100 million), Saudi Fund (US$100 million), Abu Dhabi Fund (US$100 million), and Kuwait Fund (US$100 million); (ii) Lot 1B included replacement generators for Units 5 and 6, to be included in Phase 2 of the MPA; (iii) debt servicing costs during construction phase are excluded; (iv) financing table refers to the total Program costs - each DP expected to structure phasing of financing according to its own approaches and constraints; (v) approval of financing from each DP is subject to respective review and approval processes; (vi) all numbers presented in US$ equivalent though currency of each financing may vary.

30. **The financing package of the Program includes US$2.14 billion from the state budget, US$1.25 billion in project revenues, US$2.9 billion equivalent in grants and loans from DPs**. The DSA confirmed that the financing package does not undermine public debt sustainability. In line with historical annual state spending, contributions from state budget are limited to 3-3.5 percent of GDP annually so that the GoT can meet social spending requirements. Project revenues are based on expected export tariffs and volumes per agreed PPAs.

Structuring of MPA Phases

31. **The Program is structured in two phases, informed by major implementation milestones and macro-fiscal sustainability considerations**.

(a) **Phase 1** includes achieving by 2029: (i) dam height of 1,185 masl; and (ii) installed capacity of 1,660 MW (400 MW for units 5/6, 1,260 MW for Units 3/4).

[17] It should be noted that, for hydro projects with long construction periods like Rogun HPP, it is typical for price adjustments to be significant.

(b) **Phase 2** includes achieving by 2035: (i) dam height of 1,300 masl.; and (ii) installed capacity of 3,780 MW (630 MW in all six Units).

32. **The Program is expected to be supported through financing from two IDA cycles – ongoing IDA20 and IDA21.** The Bank could consider adding additional phases towards the end of IDA21 depending on the overall financing situation, the performance of ongoing project activities, and the progress on energy reforms. The first phase of the MPA will support the overall learning agenda, where lessons from the Phase 1 will inform the design of Phase 2.

Table 2: MPA Structure (estimated amount in US$ million)

Phase #	Operation ID	Phase's Proposed DO[18]	IPF or PforR	Estimated IBRD Amount	Estimated IDA Amount	Estimated Other Amount	Estimated Approval Date	Estimated E&S Risk Rating
1	P181029	Increase supply of clean and affordable hydroelectricity for consumers in Tajikistan and the Central Asia region by 2 TWh	IPF	0.00	350.00	3,037.00	December 17, 2024	High
2		Increase supply of clean and affordable hydroelectricity for consumers in Tajikistan and the Central Asia region by 12 TWh	IPF	0.00	300.00	2,603.00	June 2026	High
Total				0.00	650.00	5,640.00		
Financing Envelope (US$ million)						6,290.00		

Table 3: IDA project financing by phase (US$ million)

	Phase 1	Phase 2	Total
Component 1: Construction activities	213	182	**395**
Component 2: Project implementation support	108	92	**200**
Component 3: RAP & LRP implementation	24	21	**45**
Component 4: Hydro meteorological activities	5	5	**10**
Total	**350**	**300**	**650**

II. PROJECT DESCRIPTION

A. Project Development Objective

(i) PDO Statement

33. The PDO is to increase supply of clean, affordable, and climate resilient hydroelectricity for consumers in Tajikistan and the Central Asia region by 2 TWh.

(ii) PDO Level Indicators

34. The key outcome indicators of the proposed Project (i.e., Phase 1 of the MPA), include:
(a) **Indicator One (CRI):** Renewable energy capacity enabled;
(b) **Indicator Two (CRI)**: People with enhanced resilience to climate risks;
(c) **Indicator Three (CRI)**: People provided with access to electricity;
(d) **Indicator Four (Custom)**: Electricity exports to Central Asia region;
(e) **Indicator Five (CRI)**: Net GHG emissions reductions per year.

[18] Note, in general, the higher the height of the dam, the higher the head in the reservoir at full supply level, the more energy can be generated.

B. Project Components

35. **Component 1: Construction activities (US$3,026 million, of which US$213 million IDA).** Activities include:

(a) *Lots 1 and 1A - Electromechanical equipment (estimated cost US$366 million, jointly co-financed US$183 million IDA and US$183 million AIIB)*: Activities include (i) design and supply of replacement runners for Generating Units 5 and 6 and design, supply, and installation of electro-mechanical equipment for Generating Units 3 and 4 with a combined installed capacity of approximately 1,260 MW, including turbines, generators, frequency governor, excitation system, electrical systems, unit-related monitoring system, cooling water system, compressed air system for the governor, fire detection and suppression systems (Lot 1); and (ii) installation of replacement runners for Generating Units 5 and 6 and other turbine rehabilitation works and control system integration (Lot 1A). The design of electromechanical equipment includes design specifications that account for projected increases in precipitation due to climate change, thereby minimizing the risk of damage or dam failure.

(b) *Lot 2 - Main dam (estimated cost US$1,335 million to be financed by the state budget and project revenues)*: Activities include construction of the dam for Rogun HPP with a height of 1,185 masl, including treatment of the salt wedge and grouting of the foundation and abutments.

(c) *Lots 3 and 3A - Right Bank structures*:

(i) *Early works – Lot 3 (estimated cost US$151 million, financed through the state budget)*: Activities include (a) site investigations and slope stabilization for atypical zone and the plunge pool; (b) site investigations for high level outlet structures 1 and for overflow spillways; (c) construction activities on: (i) access roads, tunnels, and bridges; (ii) Diversion Tunnel 4, including flip bucket and hydraulic steel structures; and (iii) construction of right bank grouting galleries from level 1 to level 4 and grouting for the right bank grout curtain from level 1 to level 3; and (d) related design works.

(ii) *Main activities – Lot 3A (estimated cost US$746 million jointly co-financed with US$30 million IDA, US$269 million ADB, US$70 million AIIB, US$296 million EIB, and US$81 million from another DP)*: Activities include (a) high level outlet structures 1 and 2; (b) overflow spillways[19]; (c) hydraulic steel structures for high level outlet structures 1 and 2 and overflow spillways; (d) plunge pool; and (e) right bank grouting galleries from level 5 to 6 and grouting for the right bank grout curtain from levels 4 to 6.

(d) *Lot 4 - Left Bank structures:*

(i) *Lot 4 early works (estimated cost US$124 million financed by state budget)*[20]: includes excavation and stabilization of the left bank slope, excavations for the headrace tunnels and shafts, urgent first-stage concreting in the powerhouse and transformer caverns, grouting galleries from levels 1 to 4, and grouting works from levels 1 to 3.

(ii) *Lot 4 main activities (estimated cost US$296 million financed by the ACG donors)* includes construction and concreting of permanent intakes of the powerhouse complex and associated upstream waterways, headrace tunnels, gate shafts, penstocks, hydromechanical equipment, remaining powerhouse and transformer hall civil works, BOP auxiliary systems, concreting of installations for the generating units, and the tailrace tunnels.

(e) *Control room (estimated cost US$8 million to be financed through project revenues)*: purchase and installation of equipment for central control room, and monitoring control and equipment for Generating Units 1-6.

36. The main dam, the storage it will provide, and the design of the right and left bank structures and the control room have several climate benefits: protection against the newly calculated PMF due to climate change, multi-year water storage for increased drought periods, and storage to compensate progressive loss of winter snow and ice storage due to warming temperatures.

[19] Construction of dam spillways addresses climate change-exacerbated flood impacts and improve dam safety.

[20] The Lot 4 Early Works are part of the Left Bank Structures that were undertaken through regional contractors to avoid delays to project implementation that would have otherwise resulted because of delays in the award of the Lot 4 Contract caused by financing constraints.

37. **Component 2: Project implementation support (US$178 million, of which US$108 million IDA, US$35 million from state budget, US$35 million from project revenues).** Activities include:

(a) *Sub-component 2.1 Project Management Consultant (US$92 million, financed through IDA)*. The PMC contract will play a key role in the supervision of key obligations in support of Rogun OJSC and PMG, and keeping DPs regularly informed, on the following: management of transition of PMC responsibilities from current ER to the new PMC, regular updates to the OIP, preparation and subsequent updating of construction supervision and quality assurance plan, preparation and subsequent upgrading of the instrumentation plan, preparation and subsequent upgrading of operations and maintenance (O&M) plan and EPP, contract management, review of contractors' implementation programs, monitoring of contractors' compliance with E&S requirements, site supervision and quality control, review and approval of payment certificates, and management services by providing core leadership positions to build the capacity of Rogun PMG.

(b) *Sub-component 2.2 Employer costs (US$70 million to be financed by the state budget and project revenues).* Activities include (i) design engineer costs for Lots 3 and 4 (including early works); and (ii) salaries of staff and rental of office space for Rogun OJSC, Rogun PMG and DFZ that are necessary for the overall project management and supervision.

(c) *Sub-component 2.3 Implementation support (US$16 million, financed through IDA)*. This subcomponent will support the implementation of project activities, including, inter alia: (i) retention of DSPOE and ESPOE; (ii) strengthening of technical, fiduciary, E&S, monitoring and evaluation and communications capacity, including Rogun OJSC's capacity to monitor BSP's implementation; (iii) strengthening corporate governance; (iv) Project audits and audits of the Project Implementing Entities' Financial Statements; (v) implementation of the Gender Action Plan (GAP) and grievance redress mechanism (GRM); (vi) carrying of technical and economic studies and advisory services that may be required during Project implementation and as may be agreed in writing with the Association; (vii) technical assistance to strengthen the capacity of Rogun OJSC to administer the PPAs; (viii) Environmental and Social Management Plan (ESMP) implementation costs; (ix) independent third-party monitoring of the implementation of the RAP and LRP; and (x) Operating Costs.

38. **Component 3: Implementation of Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) (US$178 million of which US$24 million IDA, US$138 million from state budget, and US$16 million from AIIB).** Activities include:

(a) *Sub-component 3.1*: will finance the costs related to relocation compensation and apprenticeship stipends under the RAP and LRP;

(b) *Sub-component 3.2*: will include the construction of left bank roads and bridges (through parallel co-financing by AIIB) needed to provide Project-affected people (PAPs) with uninterrupted transport connections after reservoir filling.

39. **Component 4: hydro meteorological activities (US$5 million of IDA).** This component will include:

(a) *Sub-component 4.1 Hydromet investments (approximately US$1.5 million)*: this subcomponent will finance the purchase and installation of hydro meteorological instrumentation and TA to build key monitoring capacity in the Vakhsh basin to support the operation of Rogun HPP and mitigate future climate risks, including: (i) small construction works for installation of required equipment for in-situ stations; and (ii) development of an operational monitoring and forecasting system integrating in-situ observations with satellite monitoring of seasonal snow cover extent and other variables. These activities will support improved management of climate extremes and variable water availability.

(b) *Sub-component 4.2 TA for improved water use (approximately US$2.5 million).* This subcomponent will finance activities to (i) develop the Reservoir Management Rules for the Main Reservoirs in the Vakhsh River basin, including the interim Reservoir Management Rules for the period of Rogun Reservoir construction, reservoir filling and operation; and (ii) build the capacity of the BWO Amudarya Tajikistan Branch, reporting to the MEWR and BWO Amudarya's headquarters, and to carry out tasks mandated by the ICWC for information management and water

accounting. These activities will lead to strengthened capacity to implement the basin management plan and optimize operations of the reservoir cascade in the context of climate change.

(c) *Sub-component 4.3 Monitoring water use (approximately US$1 million)*: Purchase and installation of equipment, including sensors and telemetry equipment, for the modernization, including retrofitting, of selected hydroposts located in the Vakhsh River basin to support the continuous transmission of real-time water level data from the upgraded hydroposts to BWO Amudarya Tajikistan Branch and to the National Water Information System. The hydroposts contribute to improved regional water management in response to climate change.

C. Project Beneficiaries

40. *Entire population of Tajikistan:* The proposed Project would ensure adequate, affordable and reliable electricity supply to meet the growing domestic demand of about 9.75 million people in Tajikistan, the industrial sector and other legal entities connected to the electricity network. The large reservoir would also provide electricity network balancing services and improve the resilience of the entire Vakhsh cascade of HPPs through mitigation of flooding risks. Moreover, the project would contribute to accelerated GDP growth and sustainable and equitable socio-economic development through (i) generation of additional revenues from larger exports of clean electricity to the CA region and beyond; and (ii) implementation of a national BSP.

41. *Electricity consumers in export markets for Rogun's electricity.* The project would enable the expansion of exports of clean electricity to the broader region, which currently still largely depends on gas and coal-fired generation, and it would provide additional services (e.g., reserves and balancing) to the broader CAPS at competitive prices, thus enabling the maintenance of affordable electricity tariffs for consumers in the CA region and beyond. The project would also contribute to a reduction in Carbon Dioxide (CO2) emissions in the CA region through avoided emissions from fossil fuel generation in these countries.

D. Rationale for Bank Involvement and Role of Partners

42. The Bank will enhance Rogun HPP by drawing on its global experience in the development of large hydropower projects. Specifically, the Bank can leverage its experience to improve the quality of the design and efficiency of implementation by ensuring that global best practices in technical standards, dam safety, governance, and E&S standards are followed. The Bank's continued engagement in the project also builds on extensive knowledge and experience developed through the Bank's support to the Techno-Economic Assessment Study (2011-2014). The Bank's comprehensive engagement in the energy sector of Tajikistan would also help to anchor the project in a sustainable macro-fiscal framework and a sound and transparent governance framework, and ensure that the benefits of the project are widely shared and the development impacts widely felt.

43. As a trusted impartial DP, the GoT asked the Bank to play the lead role on the RCG to engage DPs and help leverage the required financing for the project. In that context, the Bank prepared a financial options study in 2021 and co-hosted with the GoT a DP roundtable and, based on the feedback from DPs, provided TA to the project jointly with the AIIB to strengthen various aspects of preparation. In addition, the Bank has led joint missions with DPs to align and coordinate support to the various government agencies involved in the project design. Going forward, the RCG will continue to be used for the purpose of donor coordination on project implementation and monitoring and, more broadly, reform dialogue regarding the energy sector. Additionally, the relevance of maintaining the sectoral reform momentum also calls for continued World Bank engagement (including through the forthcoming DPO series) and enhanced donor coordination.

E. Lessons Learned

44. The Project draws upon the Bank's global experience and lessons learned from supporting large HPPs.

(a) ***High-level strategic Government support to such complex and high-risk hydropower project***. The lessons learned from implementation of high-risk transformative hydropower projects in developing countries demonstrates that

securing government commitment at the highest levels to the agreed-upon development approach is critical, together with direct communication channel with decision-makers. In the case of the Rogun HPP, the main project implementing entity (Rogun PMG) directly reports to the President of Tajikistan, which allows for prompt decision-making on critical issues. In addition, project implementation monitoring is closely followed by the Prime Minister to address inter-agency coordination issues.

(b) ***Solid technical project preparatory work***. It is essential to ensure that the required technical, geological, and geotechnical studies are completed in a timely manner and without any information and data gaps that may stop or delay the Project during implementation. The GoT with support from the Bank: (i) carried out the Techno-Economic Assessment Studies (TEAS, 2011-2014) that was reviewed and found by the World Bank and other parties to be of excellent quality; and (ii) hired a world-class international DSPOE and ESPOE, financed by the Bank and AIIB, to support the GoT with critical review of the construction works carried out prior to the Bank's engagement.

(c) ***Credible and macroeconomically sustainable project financing plan***. Experience has shown that any infrastructure project, including hydropower, with capital costs that are large compared to the size of the economy, should have a macroeconomically sustainable financing plan. In cases when such plans were not developed and financing had not been secured in advance, the projects were subjected to significant delays and associated technical risks (e.g., temporary civil work structures being destroyed by floods because they were not designed for such long and delayed construction periods), and in some instances, they became a source of public debt or overall macroeconomic distress. Therefore, the Bank-financed TA was critical to the preparation of a macroeconomically sustainable construction schedule and update of the financing plan.

(d) ***Establishing a strong mechanism for donor coordination*** helps ensure regular sharing of information (including an online data room), provide consistent technical advice and guidance to the GoT, and minimize transaction costs for the GoT. As indicated above, the Bank has been instrumental in helping to coordinate the DPs involved in the energy sector and in the preparation of the project, and in supporting donor coordination in considering the various implications of the project for the country's broader fiscal policy and development agenda.

(e) ***BSP***. Benefit sharing is especially important in basins with large rural populations where hydropower will affect their resources, especially for communities living in the project impact zone, as identified in, for example, the project Environmental and Social Impact Assessments (ESIAs). The project also represents an opportunity to advance development in areas which have experienced limited economic growth and have the potential to capitalize on targeted and sustained financial support, and at the national level. Therefore, the project would support implementation of local interventions targeted at project affected people and communities and at national level.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

45. **Several entities will be involved in project implementation**. The Rogun OJSC, including through the PMG, will act as the Project Implementation Entity (PIE) for components 1, 2, 3.2, and 4, and will handle any procurement aspects related to component 3.2. The Directorate of the Flooding Zone (DFZ) is responsible for component 3.1. Other entities including the MEWR, through the BWO Amu Darya Tajikistan Branch, and Hydromet will have a role to play in the project, to be detailed in the Project Implementation Agreement (PIA). IFIs will conduct joint supervision missions at least twice a year. Additional details are provided in Annex 2.

B. Results Monitoring and Evaluation Arrangements

46. Monitoring and evaluation of the PDO and Intermediate Results Indicators will be done by the Rogun PMG during implementation. DFZ will provide implementation progress reports for component 3.1 to Rogun PMG. The Rogun PMG will be responsible for submitting to the Bank (i) semi-annual implementation progress reports on the RF; and (ii) monthly

reports (prepared by the PMC, DFZ and contractors) for key activities. Rogun PMG will be supported by expert consultants for outputs needed to report on all PDO and Intermediate Result Indicators. Baseline values were provided by Rogun PMG.

C. Sustainability

47. Sustainability of the project will be secured through addressing key technical, E&S, financing and commercial issues:

(a) ***Professional advice from experienced DSPOE would ensure robust technical solutions and implementation***. The DSPOE provides timely advice to Rogun PMG on geotechnical, geological, hydraulics, electro-mechanical and other construction matters during implementation phase to ensure robust technical solutions until construction completion.

(b) ***Professional advice from experienced ESPOE ensured sound technical advice during the update of E&S documents and will continue during implementation of the project***. The ESPOE has ensured that the updated E&S documents are robust and meet the requirements of the GoT and the DPs and will provide the required advice to Rogun PMG on various issues related to contractors' compliance with E&S requirements, resolution of issues, resettlement, and other relevant matters during implementation of the proposed project.

(c) ***Strong PMC for on-site supervision to manage project complexity and interface risk.*** The PMC is responsible for strong overarching planning and coordination of project implementation activities to ensure that key risks such as interface risks between contractors are well managed, adequate Quality Assurance and Quality Control (QA/QC) procedures are implemented for robust technical quality, and day to day supervision takes place on site to guarantee Environmental and Social Framework (ESF) compliance, including on Operational Health and Safety (OHS) issues.

(d) ***Robust commercial framework is key for raising of required financing and sustainable operation of the power plant***. Development of a long-term PPAs for the export of electricity from the Rogun HPP ensures predictable cash flows for the project, critical for securing the financing to complete the construction and therefore minimize the technical risks from the delays and ensure adequate financing for operation and maintenance once the project is operational.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical

48. The design of the Rogun HPP is based on robust studies that have been subject to thorough technical review. The TEAS (2011-14) provided the base design for Rogun HPP, and guided the GoT as it re-started construction activities in 2017. Additional background on technical aspects is provided in Annexes 3 and 4.

(a) **Design review by the DSPOE**. The DSPOE (an eight-member panel established in 2022 under the Rogun TA Project) has undertaken six missions to date which have included a detailed design review that confirmed the overall design robustness of the HPP. Several key activities are underway through the TA, under review of the DSPOE, which may inform additional design changes, including on remedial measures required to address the shortcomings identified after completion of the independent assessment of diversion tunnels.

(b) **OIP update**. The key activities being considered under the OIP are design updates, updated key impounding stages, actual progress of the works to date, forecasted time for completion of critical activities, tendering scenarios, etc. Considerable work has already been done in developing the OIP and finalization is linked to completion of related ongoing studies. The current dates for key milestones are provided in Annex 4.[21]

(c) **Amendment to Lot 1 contract**. Based on the findings and recommendations from the World Bank's and AIIB's review of the Lot 1 contract between Rogun OJSC and Voith Hydro GmBH & Co. KG (Austria), Rogun PMG and Rogun OJSC

[21] It should be noted that the construction completion is different from Project implementation completion because the latter also includes additional 5 years (2039) required for filling of the reservoir to full supply level, with water withdrawals to be compliant with existing water sharing agreement among riparian countries.

renegotiated various provisions of the contract. The general conditions of contracts in FIDIC Silver Book (Second Edition 2017, with 2022 amendments) and the WB Standard Procurement Document (July 2023) for Request for Proposals Works-EPC-Turnkey-Single Stage (where disqualification mechanism for non-compliance with SEA/SH obligations does not apply), including ESF requirements, formed the basis of the negotiations. The Amendment No. 2 was reviewed by the Bank and found to be acceptable and has been signed by the parties in September 2024. The following summarizes the main findings from the review of the Amendment No. 2:

(i) Some of the renegotiated clauses improve the risk profile of the contract in favor of the Rogun OJSC, while some others result in more favorable risk allocation for the contractor.

(ii) The revised Contract price is reasonable based on the detailed cost benchmarking analysis, which was carried out by the GoT's advisor, and reviewed by the Bank.

(iii) The acceptance of aforementioned contractual risks by Rogun OJSC and Rogun PMG was based on the careful analysis of alternative solutions to completion of the Lot 1 contract, which were deemed substantially more expensive and riskier.

(iv) The GoT confirmed (in the letter dated June 21, 2024) that it was fully cognizant of the risks associated with the Amendment No. 2 and confirmed acceptance of the possible cost implications of them.

(d) **Government commitment to retender the critical scope of work for right bank structures**. The technical review of the procurement process and existing Lot 3 contract with TGEM (Tajikistan) concluded that the contractor was selected through direct contracting and did not meet the minimum requirements for financing by potential financiers. Thus, the GoT committed to retender the remaining scope of right bank structures (Lot 3A), with exception of DT-4 and some other works that are underway. This will ensure the project has a viable financing plan given strong interest from DPs to finance Lot 3A. The procurement process for Lot 3A is expected to launch by effectiveness following WB procurement guidelines.

(e) **Transmission capacity**. There is sufficient existing transmission capacity to allow for safe evacuation of generation from the project. There are two existing 500 kV overhead transmission lines (OHL) allowing for supply of 2,200 MW of the project electricity to the grid. One OHL connects to Dushanbe substation with possibility of 1,000 MW supply to Sughd region in the North with subsequent exports to Uzbekistan and another 1,000 MW to Regar substation. There are two additional 220 kV lines under construction, which would add another 600 MW transmission capacity to the project. Moreover, the GoT has started development of a new 500 kV OHL from Rogun HPP to Sangtuda substation. Additional details on cross-border capacity (current and planned) are provided in Annex 4.

Economic analysis

49. **Methodological approach.** The economic analysis has been carried out for the whole MPA.[22]For this purpose, the net economic benefits of the project were estimated by comparing the costs and benefits under "With Project Completion" and "Without Project Completion" scenarios. Besides Tajikistan, the CA system for the purposes of this analysis included Uzbekistan and Kazakhstan as the main importers of the electricity generated by Rogun HPP. The economic analysis was carried out using 2023 US$ denominated economic costs and prices. It includes physical contingencies, but excludes the financing costs, taxes, subsidies (e.g. below cost-recovery price of electricity), and price contingencies. Main economic costs and benefits of the project completion include:

(a) **Costs**: (a) capital cost; (b) PMC; (c) land acquisition and implementation of ESMP; (d) incremental variable and fixed O&M.

[22] The economic analysis cannot be separated by phases – subsequent phases of the MPA do not have scale up of activities or new activities, or contracts that are divisible.

(b) **Benefits:** (a) avoided costs of the project decommissioning;[23] (b) avoided capital costs of new generation and transmission projects to replace supply and provide similar network stability services from the project; (c) increased export volumes and revenues; (d) protection of Vakhsh cascade against the PMF; and (e) reduced CO2 emissions.

50. **The economic NPV is above US$1 billion and EIRR is above the economic discount rate of 8 percent**. The results of the switching value analysis suggest that substantial variation of main variables would be required to make the project economically non-viable. The project's economic viability is most sensitive to changes in the volume of exports. The net emissions reduction is estimated at 99 million tCO2e over 35 years. The total global benefit from reduction of those emissions over the same period and for the overall Central Asia region, valued at shadow cost of carbon, is estimated at US$8.4 billion and US$16.7 billion at low and high shadow prices of carbon, respectively (US CPI adjusted - 2023 $US).

51. The project would also generate significant development benefits in the form of a long-term reliable low-cost electricity for Tajikistan's economy. It also enables the expansion of exports of clean electricity to the broader CA region, which still largely depends on gas and coal-fired generation. Therefore, the project would generate CO2 reduction benefits, which cannot be easily monetized at this time due to the evolving nature of the global carbon market. Nevertheless, the GoT, with support from the Bank, is exploring options for the sale of carbon credits in voluntary markets.

Financial analysis

52. The financial analysis of the project was carried out to evaluate the Financial Internal Rate of Return (FIRR) considering the OIP, base case financing structure, base case revenue streams from sale of electricity (based on PPA pricing and volumes), fixed and variable O&M costs, debt service costs, and expenses for the BSP. The main inputs and assumptions are summarized hereunder. The project financial model covers the period from 2024 to 2062 given the long useful life of the assets.

53. **The main project costs are the capital costs to complete the construction, debt service, and the incremental O&M costs**. The schedule for completing the construction of the project was largely influenced by the limits of the state's yearly budget financing and external borrowing, with the goal of maintaining the country's macroeconomic stability.

54. **The project's revenues are estimated to be sufficient to service the debt during the operational phase, cover its operating expenditures, finance the benefit sharing program, and pay dividends to the GoT**. The project's cash flows from operations are expected to increase as the construction progresses and the project generates more electricity for domestic sales and exports. The debt service costs are expected to be modest during the period of 2024-2036 because most of the debt is relatively concessional with grace periods of about 10 years. This means that the project would need to finance largely interest costs during the first period, which is essential for the financial viability of the project given the long construction period. The ability of the project to service the debt is also critical for ensuring that the project does not generate an additional burden for MOF to service the debts that Tajikistan would be raising from financing institutions.

55. **The FIRR of the project under the Base Case Scenario is estimated to be above the weighted average cost of debt service of approximately 3.0 percent.** This was considering the base case values for project implementation completion schedule, construction completion cost, tariffs for sales to domestic and export markets, and forward rates for 6-month SOFR. Sensitivity analysis was done to test the robustness of results to changes in the factors with the largest impact on FIRR (construction cost and export tariff, given the project is largely export oriented).

56. **According to the sensitivity analysis, the Rogun HPP remains financially viable even in the face of price escalation**. For example, even in the case of US$1 billion increase in the capital construction cost, the project would remain financially viable. This is largely due to the impact of export tariffs and the low weighted average cost of debt service.

Financial Analysis of Rogun OJSC

57. **Historical financial performance.** Revenue has been steadily growing since the commissioning of Units 5 and 6. In 2019-2021, the company averaged TJS250 million (US$22 million) per year in total revenues from the sale of electricity

[23] This is a realistic counterfactual because the GoT would still make investments to ensure adequate domestic supply, if Rogun is not built, given that electricity service is an essential public good. Moreover, the GoT is likely to explore other alternative investments for export opportunities.

internally into Tajikistan's electric grid. During the past few years, revenues have been steadily increasing with a 3-year compounded annual growth rate (CAGR) of 26 percent to reach TJS295 million (US$26 million) in 2021.

58. **Gross and EBITDA[24] margins are positive, with a very lean operating cost structure.** EBITDA margins for the past three years were in high double digits, reaching 77 percent in 2021, down from 80 percent in 2020. The largest contributor to operational costs was salaries, followed by electricity, professional services, and materials. Those costs, however, have so far been minimal, which is consistent with the nature of Rogun OJSC as a special purpose entity specifically created to manage the construction and operation of the Rogun HPP, without any other business operations. EBIT margins, however, are negative due to large depreciation charges reflective of project size. This is consistent with Rogun OJSC's nature as the entity managing the construction and operation of a very sizeable hydro dam with large assets and, accordingly, high depreciation charges. In conclusion, the financial statements of Rogun OJSC reflect the typical profile of a large-scale public infrastructure project like the Rogun HPP.

Financial Projections

59. **Rogun OJSC's large capital expenditure program will be financed through its cash flow from operations, grants and debt financing, and state budget contributions.** As the construction of the project progresses, Rogun OJSC revenues are expected to rise gradually, from US$55 million in 2024 to US$367 million in 2032. In 2024 – 2033, the project is expected to generate operating cash flows in excess of US$1.3 billion that will be utilized to finance a portion of the US$6.29 billion in remaining capital expenditures. Over the same period, the contributions from the GoT in the form of direct financing of certain lots are expected to exceed US$2 billion, in line with the annual limits set by the IMF. Remaining financial needs, estimated at about US$2.9 billion, will be met through grants and loans.

Corporate Priorities

60. **Gender**. Female labour force participation in the energy sector of Tajikistan is the lowest in CA**.** The national average is 11.5 percent with wide variance between key players such as BT at 7.4 percent and PEC at 15 percent.[25] Based on the finding of the recent WB report on Gender Gaps in Central Asia, Tajik energy sector companies do not have supportive gender policies, and several factors explain the large gender gap, including gender-based discrimination in recruitment processes and field assignments, lack of female role models and networking opportunities. The Project will work with the implementing entities to support implementation of specific interventions set forth in the GAP to address the gender gaps and work towards increase female representation in employment in the energy sector through: (i) facilitating science technology engineering and mathematics training for women; (ii) advancing the recruitment, retention and promotion of women through professional development courses and mentoring programs; and (iii) promoting an inclusive and safe work environment through launching an on-site childcare facility. The Project will also facilitate the implementing entities to sign up for the World Bank supported WeSEE network launched in December 2023.[26] The indicator will track the share of women (disaggregated by new hires and existing employees) taking jobs as workers and in technical and managerial positions at OJSC, DFZ and Rogun PMG resulting from these project interventions.

61. A GAP has been prepared and published during the month of February 2024 and will be further updated under component 3 of the Project. It identifies actions under three priority areas: (a) building and strengthening capacity to address Gender Based Violence (GBV) and Sexual Exploitation and Abuse / Sexual Harassment (SEA/SH) risks at or near the Rogun HPP project sites, in the three implementing entities for the project and resettlement sites; (b) creating socio-economic opportunities for women and girls PAPs; and (c) creating greater opportunities for women as workers and employees with the Rogun project and its three implementing entities. GAP implementation requires additional staff at

[24] Earnings before interest, taxes, depreciation, and amortization

[25] Percentage of women employed in the electric, power, gas, steam and air conditioning supply sector in Tajikistan. Women and Men of the Republic of Tajikistan, Agency on Statistics under the President of the Republic of Tajikistan, 2020.

[26] WeSEE (Women's Empowerment in Sustainable Energy in Europe and Central Asia) is a regional initiative aimed at strengthening women's employment in the energy sector in the Europe and Central Asia region.

Rogun PMG with the requisite skills. An experienced third-party Gender Program Manager will be engaged and embedded within Rogun PMG to oversee the GAP's implementation.

62. **Citizen engagement**. The Stakeholder Engagement Plan (SEP) includes a section on citizen engagement (CE) which complements existing measures for public consultations and grievance management, and commits the Bank to regular engagement with CSOs during implementation. This ensures the continuous feedback on the social benefits of the project, including services and amenities, community development activities and broader BSP.

63. **Paris Alignment**. The operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation. **Assessment and reduction of mitigation risks:** The Project is universally aligned given that the net reduction of CO2 emission due to reduction in the share of fossil fuel generation in the total electricity supply mix in Tajikistan and the export markets of Uzbekistan and Kazakhstan is estimated at 99 million tCO2e over 35 years. The total global benefit from reduction of those emissions, valued at low range shadow cost of carbon, is estimated at US$8.4 billion over the same time period, given that CA countries importing clean electricity generated by the Rogun HPP would replace a substantial share of future coal and gas-fired generation during its useful lifetime. Moreover, the project is not in flooding areas with high carbon stocks or high biodiversity and biogenic emissions from the Rogun reservoir are expected to be quite modest. The gradual impoundment of the reservoir over a period of about 6 years would act as mitigating factor to reduce emissions. **Assessment and reduction of adaptation risks:** Climate change studies in the region predict two main trends on a regional scale: a general increase in temperature and no major change in overall precipitation, although there may be seasonal changes as more precipitation falls as rain and less as snow and increasing annual as well as interannual variability. Based on the predictions of best available climate models, no significant adverse risks from climate change to the Rogun HPP project are expected. River flood hazard is classified as very low, in the Rogun area and the Vakhsh river is a snow and glaciers melt influenced river. The high flows are related to the thaw season with main peaks in July and August and discharge is not correlated to precipitation. In general, the additional storage capacity of Rogun could help buffer the increased variability. The Rogun HPP provides opportunity to mitigate adverse effects of climate change on downstream areas (Nurek HPP), as it is designed to attenuate extreme floods up to PMF and the water discharge structures (e.g., surface spillways and flood-discharge tunnels) are designed taking this into account. Rogun HPP would also provide increased flood protection for the entire Vakhsh cascade that is designed for 10,000-years return period floods, which is lower than the PMF for Rogun HPP. Hence, the operation adequately reduces the physical climate risks to the project outcomes, and the project's climate resilience and adaptation design considerations limit the exposure to an acceptable level of residual risk. Additional details of climate change risks and adaptation opportunities are provided in Annex 7.

Rationale for public sector provisioning/financing

64. Public financing of the Project is justified given: (a) the prohibitively high cost of commercial financing of the project at this stage considering project construction risks; (b) that private financing is currently not sustainable from public external debt sustainability perspective; and (c) significant economic development impacts from the project, including positive externalities in form of reduction in GHG emissions in the CA region.

65. The Bank has explored options for private sector participation in the Rogun HPP. Specifically, it carried out a market sounding during preparation of a Financing Options Study (2021) to gauge private sector interest. The study indicated that, while there is potential for private sector participation, investors' interest is affected by the construction and completion risks for the project and the mismatch between the upfront financing needs for the project and the revenue stream which will only fully materialize in a decade. The construction and completion risks for the project are still considered to be high from commercial lenders and private financiers' perspective given the complexity and the brown-field nature of works with resulting risks on completion delays and cost over-runs. Investors' interest is also affected by the mismatch between the significant upfront financing needs for the project and the revenue stream which will only fully materialize in a decade. Furthermore, commercial financing at this stage of the project may be unsustainable given the high estimated cost of US$ borrowing for Tajikistan, where interest rates are in the range of 10-15 percent. This means

that the private sector involvement will likely only materialize in the later stages of the project, primarily in the form of the operation and maintenance of the energy production.

66. The project will also generate significant development benefits in the form of a long-term reliable supply of low-cost electricity for development of Tajikistan's economy. It would also enable the expansion of exports of clean electricity to the broader CA region, which still largely depends on gas and coal-fired generation. Therefore, the project would generate CO2 reduction benefits, which cannot be easily monetized given that voluntary carbon markets are in infancy stage and facing a number of challenges (including regulatory harmonization, verification and measurement), which resulted in prices for both nature and technology-based offsets that are substantially lower than shadow price of carbon the World Bank is using for analytical purposes.

B. Fiduciary

Financial Management

67. The Financial Management (FM) arrangements at the Rogun PMG and DFZ meet the minimum requirements of the World Bank's Policy, subject to capacity building actions. The Rogun OJSC, through PMG, and the DFZ will oversee the project implementation arrangements. In the case of FM, Rogun PMG will handle components 1, 2, 3.2, and 4, and DFZ will handle component 3.1. DFZ has no prior experience in implementation of Bank-funded projects, or with any other donors. To strengthen FM performance, the following FM capacity-building actions have been agreed as legal covenants within 60 days of effectiveness: (i) an accounting software satisfactory to the WB is installed and maintained for Project accounting, budgeting, and reporting by the DFZ; and adapted as necessary for the Rogun PMG; (ii) an FM Specialist to be hired as part of the Project to provide daily support to the Chief Accountant of the DFZ, and possibly another FM/disbursement specialist to be hired to the Rogun PMG; (iii) the FM manual clearly describing how the cash compensation and cash stipends will be paid to beneficiaries and monitored by DFZ is developed and adopted by DFZ as a disbursement condition for component 3.1; and (iv) the FM manual is adapted for the Rogun PMG with the focus on how the payments to contractors/consultants will be verified and how assets constructed under the project will be transferred to and accounted for by the Rogun HPP as a disbursement condition for components 1, 2, 3.2, and 4. The revenues generated by Rogun OJSC from the sale of electricity from Rogun HPP will be distributed according to a cash waterfall mechanism[27] specifying the order in which expense would be covered (O&M costs, then debt servicing, then BSP, then capex investments, then retained earnings that go to state budget as dividend payments). This flow of funds is not subject to the Bank project audit. However, the PIA and cash waterfall decree will include various transparency measures on key data such as publication of operational data, audited and unaudited financial statements for Rogun OJSC, audit of the cash waterfall mechanism, etc.

68. Additional recurring legal covenants are included in the Disbursement and Financial Information Letter (DFIL): (i) Financial Reports: the Rogun PMG will prepare and furnish to the Bank not later than forty-five days after the end of each calendar quarter, interim unaudited financial reports ("IFR") for the Project covering the expenditures incurred by both Rogun PMG and DFZ; and (ii) Audits: each audit of the project Financial Statements shall cover the period of one fiscal year of the Rogun PMG and DFZ, commencing with the fiscal year in which the first withdrawal was made. The audited Financial Statements for each such period shall be furnished to the Bank not later than six months after the end of such period and made publicly available in a timely fashion and in a manner acceptable to the Bank. The audit terms of reference will be expanded to cover extra verification of payments to resettled people and cash stipends. In addition, the annual audit of the IFRS financial statements of Rogun HPP will need to be carried out annually by auditors and terms of reference acceptable to the Bank. Component 1 will use the direct payment, reimbursement and special commitments disbursement methods, while components 2, 3 and 4 can also utilize advance method of disbursement. The detailed disbursement arrangements, including the ceiling of the Designated Account, are provided in the DFIL.

Procurement

[27] To be detailed through a decree supported through the forthcoming DPO.

69. Procurement under the Components of the project financed by the World Bank will be conducted in accordance with the World Bank's "Procurement Regulations for IPF Borrowers" (Procurement Regulations), dated September 2023, the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006, and revised in January 2011 and as of July 1, 2016, and other provisions stipulated in the Financing Agreement. The Rogun PMG will be responsible for the procurement of goods, works and services and contracts will be co-signed by Rogun OJSC.

70. The Lot 1 contract is a legacy contract procured by the GoT based on its Public Procurement Rules. The Bank conducted due diligence on the contract and concluded that the awarded contractor is eligible and qualified, the price of the contract is reasonable and that there had been no violations of the Bank core procurement principles of fairness, transparency and efficiency. The Bank also advised the GoT to consider revising the contract to improve the overall risk allocation, align its implementation with the new overall financing plan and take into account Bank requirements on Bank ESF and Anti-Corruption Guidelines. The negotiated amendment made the contract fairer than before and overall acceptable to the Bank on a fit-for-purpose basis, and was signed in September 2024. A series of risk mitigation measures have been agreed with GoT as part of the overall Project implementation. In particular, it was agreed that Bank will provide enhanced oversight to any further amendments to the Lot 1 contract.[28]

71. **Summary of the PPSD:** A market assessment was conducted for new packages relating to electromechanical equipment, civil works and project management consultants. The market assessment concluded that: (i) *the services required are in a niche market segment*: large scale hydropower is a niche market, with only a few firms globally actively participating in the market; (ii) *large scale and complex project*: there are even fewer companies with the capability of providing the scale of services needed for a large and complex project such as Rogun HPP; few companies might not have the financial soundness to bid / appetite for risk exposure in terms of financial liability and forming a consortium poses an additional burden which is unappealing; and (iii) *Central Asia appears not to be a priority region for private sector interest*: with increased activity in global hydropower, many Western firms are engaged in more advanced markets closer to home (North America, Europe, Australia); the attractiveness of Tajikistan as a market is limited due to constraints such as governance issues and poor track record of payment discipline. Based on the above, bidder participation is expected to be low. The market assessment combined with value of the contracts recommends open competition preceded by intense market engagement as preferred market approach for the procurement process.

C. Legal Operational Policies

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

72. OP 7.50 applies to the Project since the Rogun HPP is located on the Vakhsh River, a tributary of the Amu Darya River which is an international waterway. Riparian consultations with countries and stakeholders took place on November 8, 2023, in Almaty (Kazakhstan) and on October 28, 2024, in Tashkent (Uzbekistan) as part of the environmental and social assessment process. In accordance with the Policy, riparian notification letters and all relevant information about the Project were sent to Kyrgyz Republic, Turkmenistan and Kazakhstan in September 2023, to Afghanistan in October 2023 and to Uzbekistan in December 2024. Three countries confirmed that they have no-

[28] Bank's future prior review of Contract Lot 1 changes to: (i) the agreed lists of Subcontractors and Suppliers; (ii) changes that increases cost; and (ii) extensions of time.

objection to the Bank proceeding with processing the Project further. One country responded disagreeing with any existing, planned, ongoing and potential water uses which may impact its current, ongoing and future legitimate water uses in the shared basin. Another country emphasized the need to adhere to environmental and safety standards, and the rational use of the region's water resources. To address riparians' concerns, the GoT has committed to adhere to existing water sharing arrangements and maintain seasonal flow regimes, carry out a transboundary impact assessment as part of the updated ESIA, and provide data transparency. Based on this and third-party analysis, the World Bank's assessment concluded that the Project would not result in appreciable harm to the other riparian countries and would not be harmed by other riparians' potential water use. Accordingly, the Project is being processed under paragraph 8(c) of OP 7.50.

D. Environmental and Social

73. **The E&S instruments are being updated under the Rogun TA Project, with the updated draft ESIA already disclosed for further consultations.** The project is rated High for both E&S risks and impacts. The project has been managing E&S issues through instruments that were initially prepared by the GoT and then updated and enhanced through the Bank's support of the 2014 TEAS. The Bank assessed the 2014 ESIA/ESMP and first RAP (RAP 1) and LRP (LRP 1) in September 2021, providing guidance for updating the ESIA/ESMP and preparing the Resettlement and Livelihood Restoration Management Framework (RLRF) and RAP 2.

74. **The E&S instruments have been updated more recently through the ongoing Bank-financed Technical Assistance for Financing Framework for Rogun Hydropower Project** (P178819). Key E&S risks and impacts are related to (i) water resource management; (ii) dam safety; (ii) OHS; (iv) large-scale resettlement (currently over 50,000 PAPs with the possibility of going up to 60,000 across all RAPs); (v) labor management; (vi) gender issues, including social inclusion and management of GBV/SEA/SH risks; (vii) waste and material management; (viii) air and water quality; (ix) soils and geology; (x) traffic and transport; (xi) noise and vibration; (xii) stakeholder engagement and grievance management; (xiii) community health and safety; (xiv) cultural heritage; and (xv) biodiversity. Stakeholder consultations have been ongoing since 2008, focusing on resettlement and key environmental impacts. An initial draft of the ESIA/ESMP was disclosed in-country in October 2023 and was discussed at a November 2023 meeting with riparian government representatives and NGOs. The updated draft ESIA/ESMP was disclosed on December 22, 2023[29] at the World Bank's external website and on the Rogun PMG's website[30]. Additional consultations on the updated ESIA/ESMP have been taking place since January 2024, and a continuous engagement with stakeholders is planned during implementation. The ESIA/ESMP will be finalized prior to the Effective date of the financing. The World Bank also intends to provide Hands On Enhanced Implementation Support (HEIS) during the implementation phase.

75. **The Project has also prepared a RLRF, a Labor Management Plan (LMP), SEP, and GAP which were disclosed prior to Appraisal**.[31] Additional E&S management plans, including an update of RAP 2, LRP 2 will be prepared, consulted upon and disclosed prior to Project Effectiveness, while the Biodiversity Management Plan (BMP) and Cultural Heritage Management Plan (CHMP) will be conditions of disbursement for Project activities implemented by Rogun PMG.

76. In addition to the preparation of the E&S instruments, the Bank – drawing on advice from the DSPOE and ESPOE – has been supporting PMG and DFZ enhance their E&S capacity. As a consequence, PMG and DFZ have started the process to renegotiate contracts to integrate ESF requirements, rebid certain lots with ESF requirements included in these lots, apply rigorous standards for managing dam safety issues, strengthen labor management aspects, enhance stakeholder engagement and grievance management in the resettlement process, improve livelihood restoration and build capacity to manage SEA/SH risks. These activities will continue through project effectiveness and implementation.

[29] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099122223091529585/p1810291b43c970a71993e1a8e76ceb151c
[30] http://www.energyprojects.tj/index.php/en/rogun-hpp/eko-sots-instrument
[31] https://projects.worldbank.org/en/projects-operations/document-detail/P181029?type=projects

V. GRIEVANCE REDRESS SERVICES

77. ***Grievance Redress.*** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's GRS, visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's AM, visit https://accountability.worldbank.org.

VI. KEY RISKS

78. **The overall risk of the Project is High.** Considering the risk mitigation actions identified at Appraisal stage, the overall risk to achievement of the Project development outcomes is rated as High. This is typical for a project of this size and complexity. The below section presents the summary of mitigation measures and assessment of main residual risks.

79. **Political and Governance Risk is Substantial.** Despite the substantial governance and transparency challenges in the sector, there is strong support at the highest level on the priority of Rogun HPP Project and the authorities have demonstrated strong commitment to accompany the project with much needed reforms. The project is also supported across the political spectrum and is consistent with the country's development strategy. However, residual risk remains concerning sector and Rogun OJSC governance aspects, in particular heightened risks of involvement of the GoT into operational/construction management; lack of corporate strategy and management of performance; and weak capacity of the Supervisory Board to manage performance of Rogun OJSC. *Mitigation measures*, following recommendations from a governance assessment conducted under the Rogun TA Project, include: (a) strengthen performance management, transparency and accountability of Rogun OJSC; and (b) capacity building on corporate governance for key staff at Rogun OJSC. Other Bank financed operations in the sector (including the forthcoming DPO series) are also supporting broader reforms regarding transparency and sector governance.

80. **Macroeconomic Risk is Substantial.** Regional and other geopolitical tensions may deteriorate Tajikistan's growth prospects over the medium term and undermine the GoT's ability to implement structural reforms, including in the energy sector. The deterioration of the macroeconomic situation, potential revenue losses, and extra spending (on public debt service and security spending) might also impact the construction work of Rogun HPP given that a substantial portion of financing will come from the state budget (including for Lot 2, the main dam). Despite signed PPAs, an unfavorable external environment may affect the creditworthiness of PPA counterparts and Rogun's export revenues from energy sales. A potential exchange rate risk on servicing public debt (due a high share of hard currency debt vs. local currency revenue) as well as a substantial increase in recurring subsidies or contingent liabilities of SOEs may undermine the GoT's fiscal position and affect the spending envelope available for Rogun HPP construction. Moreover, if the GoT deviates from the implementation of recommendations related to macro-fiscally sustainable financing plan, then considering its desire to complete the construction of the project as soon as possible, the risks of public debt distress would increase. *Mitigation measures*: (a) clear signal from all potential financiers that they will not support the project if the financing plan is not macroeconomically sustainable, and use of multi-phase approach for monitoring; (b) the ongoing policy dialogue with the IMF and the Bank including prospects of funded programs/budget support operations; (c) regular monitoring of macroeconomic developments and updates to the DSA to determine whether the financing plan would require any update(s); and (d) risk of relying on contributions from state budget mitigated by (i) demonstrated track

record of the GoT contributing approximately US$300-400 million per year to Rogun construction activities, including during constrained macro-fiscal period of COVID 19; and (ii) support from other DPs in other Lots, allowing the GoT to focus its resources on Lots 2 and 3.

81. **Sector Strategies and Policy Risk is Substantial.** The proposed intervention is consistent with the Tajikistan NDS 2030 objectives and other strategic documents. However, this risk at Project level is Substantial given the poor financial and governance performance of the electricity sector which could jeopardize the robustness of the commercial framework for Rogun HPP project and impact collection of revenues for electricity sales by the project. The overall sector financial standing will impact Rogun OJSC given that BT is one of the off-takers of electricity from Rogun HPP (with up to 30 percent of sales expected to go to BT). *Mitigation measures*: (a) sustained progress on achieving results under the PUFR to achieve targets related to tariff adjustments (strict adherence to the agreed trajectory to achieve cost recovery tariffs by 2027), transparency of financial flows in the energy sector through improvements to the sector escrow account, implementation of cost-saving measures, and adoption of good-practice governance including independent members to the supervisory boards of energy companies; (b) introduction of sector specific conditions for effectiveness and dated/recurrent legal covenants in the proposed operation; and (c) the forthcoming DPO series, which is an instrument to support continued implementation of reforms.

82. **Technical Design Risk is High.** Whilst most of the technical risks identified are typical in nature for any large HPP, the construction of the dam as well as legacy risks from works already performed warrant the highest level of dam safety and technical scrutiny. In particular, due to the location of the project in an active seismic zone, the risks related to seismicity, geology, flood management, and sediment management need detailed examination. Sedimentation-related risks have arisen because of construction delays already incurred that have impeded the rate of reservoir impoundment. Contract management is also a key technical risk. With a number of contractors working concurrently, and the scale of the project, there will be technical issues and interface coordination requirements, which may be beyond the control of the Employer (including geological surprises, natural disasters, contractor's liquidity problems, adequacy of insurance coverage and relative delays in inter-dependent contracts). *Mitigation measures*: The technical design is being reviewed in depth by the DSPOE. Several technical risk mitigation measures have been recommended by the DSPOE and are being integrated into the detailed design and the construction and monitoring procedures. Additional studies to update the related design parameters are being undertaken for hydrology and climate change, seismicity and sedimentation. Sedimentation risks will be mitigated by focusing on the relevant construction activities and adopting a modified and gradual reservoir impoundment sequence. In addition, a new PMC will be recruited to replace the existing ER. The new PMC will have an expanded scope to ensure that best practice is being followed for the design, construction and insurance of the works, in management of contracts and interfaces, and keeping the schedule and costs under control in such a complex project setting. To mitigate legacy risks, there are several studies either completed or underway through the Rogun TA, including the QA/QC audit and DT assessment, both of which identify appropriate mitigation measures.

83. **Institutional Capacity for Implementation Risk is High.** The Rogun PMG, Rogun OJSC, and DFZ have limited experience in implementation of projects financed by the Bank or other DPs, resulting in an accumulation of design and construction delays, as well as technical and dam safety issues. These interconnected issues pose a substantial risk to the project's safety, timeline, and costs, necessitating prompt and effective management to mitigate these risks. The Rogun TA Project has supported capacity building of Rogun PMG including strengthening of in-house capacity. However, further capacity building is required on: (a) geology, hydrology, and other specialized aspects of hydropower; (b) procurement and FM; and (c) monitoring and ensuring environmental compliance of the project. *Mitigation measures*: (i) hiring additional experts at Rogun PMG to strengthen their implementation capacity and trainings on technical aspects of hydropower, procurement specialists, contract management specialist, and an OHS specialist; (ii) the GoT has also agreed to include in the scope of the PMC management services to PMG under which oversight and responsibilities will be shared to improve transparency, quality and speed of decision-making processes. DFZ has some experience in implementing resettlement according to Bank's requirements since they carried out the first phase of resettlement under the project in 2014-2018. However, those activities were not supervised by the Bank, and the scale of upcoming resettlement is

much larger and would require further strengthening of DFZ capacity on implementation of resettlement according to RAP requirements. The ongoing Rogun TA Project and the proposed Project would help strengthen the capacity of all three entities, including operational phase to ensure technical sustainability of the works and equipment delivered.

84. **Fiduciary Risk is High. Residual procurement risk is High**, which reflects the complexity of the project, as well as existing procurement and technical capacity limitations in the PMG. Procurement risks include: (i) technical complexity making it difficult to define and delineate contracts; (ii) project with legacy designs which started decades ago and some data may not be easily verifiable by bidders; (iii) interface risks among contracts financed by various IFIs under different Procurement Rules; (iv) coordination risks among different IFIs; (v) governance and integrity risks; (vi) limited capacity of the Rogun PMG to conduct procurement and supervise contracts; and (vii) evaluation committees of over 20 members resulting in delays in evaluation. *Mitigation measures* include: (i) regular coordination meetings among IFIs themselves and between IFIs and Government; (ii) preparation of OIP and hiring a PMC to coordinate all project components; (iii) market sounding and engagement and establishing electronic data room for bidders to access all information: (iv) use of probity assurance, beneficial ownership disclosure and direct payment to contractors by the Bank (on approval of invoice by Employer); (v) preparation of PIA to define roles and responsibilities including governance arrangements for approval of contracts and amendments, composition of tender evaluation committees and business standards for decision making to be agreed upon with the Bank; and (vi) strong Bank oversight and implementation support including hands on enhanced implementation support (HEIS) and capacity building in procurement and contract management.

85. **The residual FM risk for the Project is Substantial**. Component 2 may be negatively affected by the issue of financing for withholding taxes, which has been unresolved under the Rogun TA for more than 12 months. Except for custom duties, excises and social charges (which will be eligible for financing under the project), the Government confirmed its intention to seek an exemption from all other applicable taxes or to provide the funds to cover them. Component 3, including resettlement cash compensations and cash stipends, will be processed by the DFZ, which doesn't have any prior experience of working with the WB and will be in charge of a vast number of payments to individuals. The *mitigation measures* include detailed payment and verification procedures of cash payments and the extended audit coverage of 10 percent of beneficiaries annually. For payments of large contracts, the direct payment and reimbursement methods will be used to mitigate the risks of improper use of funds. Further measures are described in paragraphs 67-68.

86. **Environmental Risk is High.** The Rogun TA Project is financing the updating and preparation of E&S instruments for the Rogun HPP. The Rogun HPP involves significant civil works related to the completion of the dam; right bank structures and spillways; left bank structures, headrace tunnel, and powerhouse; and access roads and camps. Rogun will entail permanent inundation of a reservoir with gross storage of 13.3 km3 with the reservoir surface area of about 110 km2. These are expected to have potentially significant adverse and long-term risks and impacts on the biophysical and cultural environment. Risks and impacts due to Associated Facilities, like transmission lines and access roads, also add another set of environmental issues that would need careful planning for appropriate environmental management measures during design and construction as well as operation phases. OHS risks are also expected to be adverse considering the large number of workers to be deployed at the site during construction. Risks and impacts of pollution of local air and water would be significant during construction, given the scale of construction, need to remove cut material from hillside, and significant movement of labor and vehicles. Rogun HPP also requires substantial security measures to protect the large site. The works and inundation of the reservoir area are expected to have potential adverse risks and impacts on both terrestrial and aquatic ecosystems and biodiversity, including potential cumulative and transboundary impacts. The assessment and proposed management of said environmental risks and impacts are addressed in the updated E&S instruments, including the ESIA/ESMP. Subsequent, site-wide guidelines and site-specific management plans will be prepared and will be ready by the Effectiveness. These include the waste management guidelines/templates, traffic management plan, security management plan, and cultural heritage management plan. Furthermore, a Rapid Cumulative Impact Assessment was prepared, while a detailed Cumulative Impact Assessment will be completed by Effectiveness. Furthermore, no later than one month after Effectiveness, a consultant will be hired to conduct an investigation of all

areas used for construction, past and present, to identify legacy wastes and contaminated lands, including asbestos and polychlorinated biphenyl compounds, and propose remedial measures in a written report.

87. **Social Risk is High.** Given the complexity of the social risks and impacts to be assessed, the social risk rating is High. Key challenges include: (a) stakeholder and citizen engagement in a project that will have profound socio-economic impacts for PAPs – including vulnerable groups – due to economic and physical displacement, establishment of new communities, restoration of livelihoods (e.g. agriculture, fisheries, light manufacturing, service occupation) and opportunities for benefit-sharing; (b) large resettlement, with critical requirements to address the impacts of physical and economic displacement (more than 50,000 people[32]: 2,697 have been resettled in the first phase of resettlement; the second phase involves 16,919 PAPs, of which about half have completed the resettlement process, with critical requirements to address the impacts of physical and economic displacement; (c) an effective grievance mechanism for handling a large volume of complaints, with systems for recording complaints and outcomes; (d) labor management challenges, including working terms and conditions, OHS, the establishment of safe and effective work camps for thousands of workers and eventual retrenchment - already, work accidents have happened which highlight the importance of adequate and monitored work safety measures and, as per World Bank procedures, a root cause analysis of these accidents is underway and the World Bank and the Government are working to incorporate observations for strengthening OHS practices at work sites; and (e) community health and safety issues, including labor influx, with attendant risks related to social conflict, gender-based violence, sexual exploitation and abuse/sexual harassment, transmission of disease and security issues. *Mitigation measures*: The management of social risks will be addressed in the updated E&S instruments, namely the ESIA/ESMP, RLRF, RAP 2/LRP 2 and CHMP, as well as the LMP, SEP, GAP, and where necessary, any additional social plans and studies prepared during Project implementation.

88. **Stakeholder Risk is Substantial.** The GoT and the Bank have held several consultations with key stakeholders, comprised of local residents near Rogun HPP, the electricity consumers, key local and central government bodies, CSOs, scientific organizations and riparian countries, which have provided a venue to express support and concerns for the project. CSOs have raised several complaints, with a focus on E&S and riparian issues. During project implementation, the Bank and the GoT will actively engage CSOs, potentially including in project implementation and monitoring, especially regarding resettlement and livelihood restoration, and the BSP. The project is highly relevant to several of the Fragility Conflict and Violence drivers identified in the Risk and Resilience Assessment (RRA) of CA and Afghanistan Border Areas, including the lack of an effective binding arrangement among all riparian countries over shared water resources and the lack of dispute resolution mechanisms amid growing populations and climate stressors. There is also a risk that the potential PAPs (those to be resettled) may not provide the required cooperation with consultants that would prepare the RAPs. *Mitigation measures*: (a) early notification to riparian countries, per OP7.50 process (notification letters sent to all riparian countries September 2023 and riparian consultations event held in Almaty November 2023); (b) ensuring that filling of the reservoir respects existing water sharing arrangements through appropriate legal covenants, and data transparency; (c) consultations with neighboring countries on water related issues through existing regional organizations, or in other appropriate formats, as part of broader regional engagements in the water sector in CA;[33] (d) strong continuous engagement with CSOs through ongoing consultations on E&S instruments and CSO engagement on project monitoring; (e) a robust communication strategy to ensure transparent communication with the local and international community, providing regular updates on the project's progress, and explaining the safeguards and systems in place to ensure that the project is executed responsibly and sustainably; and (f) the development of the BSP, which would send a strong signal about the project's focus on improvement of livelihoods of local communities.

[32] This number could increase to 60,000 people by the end of the resettlement process.

[33] Consultations to date have been held in Almaty, Kazakhstan (November 2023) and Tashkent, Uzbekistan (October 2024), with GoT and NGO/CSO representatives. Key issues discussed included: dam safety; downstream cumulative impacts; any possible impacts of climate change on the operation of the Rogun and Nurek Dams; analysis of alternatives; water allocation in the Amu Darya Basin; seismic and other geological impacts (e.g. salt wedge) on the dam's stability; and stakeholder engagement. Further consultations are planned in the riparian states.

ANNEX 1: Results Framework and Monitoring

PDO Indicators by PDO Outcomes

Baseline	Closing Period
Indicator One: Renewable energy capacity enabled	
Renewable energy capacity enabled (Gigawatt)	
Dec/2022	Jun/2029
0.04	1.66
Indicator Two: People with enhanced resilience to climate risks	
People with enhanced resilience to climate risks (Number)	
Nov/2022	Jun/2029
0	9,750,000
Indicator Three: People provided with access to electricity	
People provided with access to electricity (Number)	
Nov/2022	Jun/2029
0	9,750,000
Indicator Four: Electricity exports to Central Asia region	
Electricity exports to Central Asia region (GWh) (Gigawatt-hour (GWh))	
Dec/2022	Jun/2029
0	1,698
Indicator Five: Net GHG emissions reduced per year	
Net GHG emissions reductions per year (MtCO2/year) (Text)	
Dec/2022	Jun/2028
0	1.74 (average/year)

Intermediate Indicators by Components

Baseline	Closing Period
Component 1: Construction activities	
Generation capacity of energy constructed or rehabilitated (Megawatt)	

Nov/2022	Nov/2028
0	1,660
➢Hydropower generation capacity constructed under the project (Megawatt)	
Nov/2022	Nov/2028
0	1,260
➢Hydropower generation capacity rehabilitated under the project (Megawatt)	
Nov/2022	Nov/2028
0	400
New generating units supplied and installed under the Project (Number)	
Nov/2022	Nov/2028
0	2
Supply and installation of replacement turbine runners for Units 5 and 6 completed under the Project. (Number)	
Nov/2022	Nov/2028
0	2
Component 2: Project implementation support	
Preparation and update of (a) construction supervision and quality assurance plan; and (b) instrumentation plan is completed (Yes/No)	
Dec/2022	Dec/2028
No	Yes
Preparation and update of the O&M plan and EEP is completed in phased manners (Yes/No)	
Dec/2022	Dec/2028
No	Yes
Retention of DSPOE and ESPOE until 2029 for Phase 1 and 2035 for Phase 2. (Yes/No)	
Sep/2024	Jun/2029
Yes	Yes
Share of women taking on jobs at OJSC, DFZ and Rogun PMG as workers and in technical and managerial levels (Percentage)	
Sep/2024	Jun/2029
TBC	30
Component 3: RAP and LRP implementation	
Number of the Project Affected People (PAP) compensated as part of involuntary resettlement (Number)	
Dec/2022	Dec/2032
0	10,000
Percentage of registered project related grievances responded during project implementation (Percentage)	
Dec/2022	Dec/2028
0	100

Percentage of citizens who believe that the Project has established effective engagement (Percentage)	
Dec/2022	Dec/2028
0	at least 80%
Number/Percentage of people benefitting from the Benefit-Sharing Program of the Rogun HPP project (Percentage)	
Dec/2022	Dec/2028
0	at least 20% of the target
Component 4: Hydro meteorological activities	
Water level and discharge data from modernized hydroposts is shared twice a day with the MEWR and BWO Amudarya Headquarters (Yes/No)	
Sep/2024	Jun/2029
No	Yes

Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Indicator One: Renewable energy capacity enabled	
Indicator One: Renewable energy capacity enabled (Gigawatt)	
Description	This indicator will measure the generation capacity of renewable energy facilities (hydropower generators) constructed or rehabilitated through operations supported by IDA.
Frequency	Semi-annual/Annual
Data source	Rogun PMG progress implementation reports of the PMC, contractor and technical reports of the DSPOE.
Methodology for Data Collection	Review of implementation progress for the new units installed (Units 3-4) and turbine runners/generators replaced (Units 5 &6)
Responsibility for Data Collection	Rogun PMG
Indicator Two: People with enhanced resilience to climate risks	
Millions of people with enhanced resilience to climate risks (Number)	
Description	This indicator will measure the number of people benefiting directly and indirectly from improved climate risk management and increased climate resilience due to the investments by IDA.
Frequency	Annual
Data source	Staff estimates
Methodology for Data Collection	To be developed per updated corporate score card methodology (currently under development)
Responsibility for Data Collection	WorldBank/Rogun PMG
Indicator Three: People provided with access to electricity	
Millions of people provided with access to electricity (Number)	
Description	This indicator will measure the number of people that have received new or improved electricity service in Tajikistan through operations supported by IDA.
Frequency	Annual
Data source	Population surveys by UN and Statistical Agency under the President of the Republic of Tajikistan
Methodology for Data Collection	Annual survey reports.
Responsibility for Data Collection	Rogun PMG
Indicator Four: Electricity exports to Central Asia region	
Electricity exports to Central Asia region (GWh)	
Description	The indicator will measure the energy generated by Rogun HPP that is exported from Tajikistan.
Frequency	Annual
Data source	Invoices for electricity exports.
Methodology for Data Collection	The annual Rogun HPP export data (not cumulative).
Responsibility for Data Collection	Rogun PMG
Indicator Five: Net GHG emissions reduced per year	
Net GHG emissions reductions per year (MtCO2/year) (Text)	
Description	This indicator will measure the tons of relevant greenhouse gas reduced compared to alternatives.
Frequency	Annual
Data source	Updated project economic analysis to estimate the emissions from combination of fossil-fuel based power generations and from the Rogun HPP as per supply mix simulations under “without Rogun project” scenario on least-cost generation expansion plans and simulation of power system electricity generation/dispatch. Climate Watch Historical GHG Emissions, World Development Indicators
Methodology for Data Collection	The annual Rogun HPP annual generation data.
Responsibility for Data	Rogun PMG

Collection	

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Component 1: Construction activities	
Generation capacity of energy constructed or rehabilitated (Megawatt)	
Description	This indicator measures the increase in total generation of the new units installed for Units 3-4 (1260MW) and turbine runners and generators replaced for Units 5 and 6 (400MW).
Frequency	Semi- annual
Data source	Project implementation progress reports from PMC, contractor and technical reports of DSPoE
Methodology for Data Collection	Review of the implementation progress reports
Responsibility for Data Collection	Rogun PMG
Hydropower generation capacity constructed under the project (Megawatt)	
Description	This indicator measures the increase in total generation of the new units installed for Units 3-4 (1260MW)
Frequency	Semi- annual
Data source	Project implementation progress reports from PMC, contractor and technical reports of DSPoE
Methodology for Data Collection	Review of the implementation progress reports
Responsibility for Data Collection	Rogun PMG
Hydropower generation capacity rehabilitated under the project (Megawatt)	
Description	This indicator measures the increase in total generation of the new turbine runners and generators replaced for Units 5 and 6 (400MW).
Frequency	Semi- annual
Data source	Project implementation progress reports from PMC, contractor and technical reports of DSPoE
Methodology for Data Collection	Review of the implementation progress reports
Responsibility for Data Collection	Rogun PMG
New generating units supplied and installed under the Project (Number)	
Description	This indicator measures supply of the replacement turbine runners for Unit 5 and 6
Frequency	Annual
Data source	Project implementation progress reports from PMC, contractor and technical reports of DSPoE
Methodology for Data Collection	Review of the implementation progress reports
Responsibility for Data Collection	Rogun PMG
Supply and installation of replacement turbine runners for Units 5 and 6 completed under the Project (Number)	
Description	This indicator measures supply of the replacement turbine runners for Unit 5 and 6
Frequency	Semi- annual
Data source	Project implementation progress reports from PMC, contractor and technical reports of DSPoE
Methodology for Data Collection	Review of the implementation progress reports
Responsibility for Data Collection	Rogun PMG
Component 2: Project supervision support	
Preparation and update of (a) construction supervision and quality assurance plan; and (b) instrumentation plan is completed (Yes/No)	
Description	This indicator measures the support provided by the Project Management Consultant (PMC) on contract management and construction supervision and quality assurance of the Rogun HPP project including: (i) preparation of construction supervision and quality assurance plan; (ii) instrumentation plan; (iii) O&M plan and EPP in phase manner;
Frequency	Annual

Data source	Finalised construction supervision and quality assurance plan and instrumentation plan
Methodology for Data Collection	Review of the construction supervision and quality assurance plan and instrumentation plan
Responsibility for Data Collection	Rogun PMG
Preparation and update of the O&M plan and EPP is completed in phased manners (Yes/No)	
Description	This indicator measures preparation completion of the required plans - O&M Plan and EPP
Frequency	Annual
Data source	Finalized O&M plan and EPP
Methodology for Data Collection	Review of the O&M and EP Plans
Responsibility for Data Collection	Rogun PMG
Retention of Dam safety and E&S Panels of Experts until project implementation completion (Yes/No)	
Description	Retention of DSPOE and ESPOE until 2028 for Phase 1 and 2035 for Phase 2;
Frequency	Semi-annual
Data source	Implementation progress reports
Methodology for Data Collection	Review of the panel reports
Responsibility for Data Collection	Rogun PMG
Share of women taking on jobs at OJSC, DFZ and Rogun PMG as workers and in technical and managerial levels (Percentage)	
Description	This indicator will monitor share of women (disaggregated by new hires and existing employees) taking jobs as workers and in technical and managerial positions at OJSC, DFZ and Rogun PMG resulting from project interventions (mentoring program, flexible working, changes to corporate policies, childcare support, internship programs).
Frequency	Annual
Data source	Progress reports of Rogun PMG
Methodology for Data Collection	Review of the progress reports and data segregated by implementing partner, distinguished between new and existing staff (being promoted); type of job (technical, managerial, support staff) and type of contract (temporary, permanent)
Responsibility for Data Collection	Rogun PMG
Component 3: RAP and LRP implementation	
Number of the Project Affected People (PAP) compensated as part of involuntary resettlement (Number)	
Description	Implementation of RAP requirements including additional staffing; involuntary resettlement (e.g. compensation to be paid to project affected people and livelihood restoration as part of involuntary resettlement associated with the Phase 2 RAP; Number of PAPs compensated as part of involuntary resettlement
Frequency	Annual
Data source	RAP implementation completion reports/audits
Methodology for Data Collection	Approved evidence on number of PAP resettled and compensation paid
Responsibility for Data Collection	DFZ and Rogun PMG
Percentage of registered project related grievances responded during project implementation (Percentage)	
Description	This indicator will monitor the registered complaints submitted by PAPs subject for prompt review and addressing of the project-related concerns.
Frequency	Monthly
Data source	Project related GRM reports
Methodology for Data Collection	Periodic monitoring of the effectiveness of grievance mechanism established by Rogun PMG for handling a potentially large volume of complaints, with systems for recording complaints and outcomes
Responsibility for Data Collection	Rogun PMG/DFZ
Percentage of citizens who believe that the Project has established effective engagement (Percentage)	
Description	This indicator will monitor progress with citizen engagement activities

Frequency	Semi-annual
Data source	Reports on citizen engagement activities
Methodology for Data Collection	Third-Party monitoring Survey
Responsibility for Data Collection	Rogun PMG
Number/Percentage of people benefitting from the Benefit-Sharing Program of the Rogun HPP project (Percentage)	
Description	This indicator will monitor the benefit of the well-designed local community and/or national benefit sharing program of the Rogun Project allowing the communities to benefit from the portion of the project's revenues to be allocated to such to this program
Frequency	Semi-annual
Data source	BSP implementation reports
Methodology for Data Collection	Review of BSP implementation reports
Responsibility for Data Collection	Rogun PMG
Component 4: Hydro meterological activities	
Water level and discharge data from modernized hydroposts is shared twice a day with the MEWR and BWO Amudarya Headquarters (Yes/No)	
Description	Selected hydroposts in the Vakhsh river basin have been modernized and are continuously transmitting data to the MEWR through the BWO "Amudarya" branch in Tajikistan. Water levels and discharge data is being shared twice a day with the Headquarters of BWO Amudarya, and published on the MEWR website.
Frequency	Monthly
Data source	MEWR and BWO Amudarya Headquarters.
Methodology for Data Collection	Operational databases of MEWR and BWO Amudarya Headquarters.
Responsibility for Data Collection	Rogun PMG

ANNEX 2: Implementation Arrangements and Support Plan

COUNTRY: Republic of Tajikistan
Sustainable Financing for Rogun Hydropower Project

Implementation Arrangements

1. Rogun OJSC, through the Rogun PMG, will be the main PIE, responsible for the implementation of the Project for components 1, 2, 3.2, and 4; and the DFZ will be responsible for the implementation of component 3. A subsidiary agreement for components 1, 2, 3.2, and 4 will be signed between MOF and Rogun OJSC, and Rogun OJSC will enter into an implementation arrangement with Rogun PMG to delegate the execution of the fiduciary role to Rogun PMG including procurement, financial management for components 1, 2, 3.2, and 4 under the project, including implementation support activities for the benefit of DFZ. Table 1.1 provides an overview of each entity.

2. Public procurement in Tajikistan is governed by the Public Procurement Law of the Republic of Tajikistan, and the Rules for International Tender for Construction of Rogun Project. Rogun PMG has limited experience in Project execution gained from implementing the Rogun TA Project (US$20 million). This experience includes preparation of bidding documents for works and goods contracts, evaluation of bids, contract negotiations, and contract management, as well as projects funded by the state budget including preparation of bidding documents for works and goods contracts, evaluation of bids, contract negotiations, and contract management. PMG staff consists of 44 people. The Rogun TA Project has supported several activities to enhance the required in-house capacity of the Rogun PMG through hiring additional experts on technical aspects of hydropower, procurement, contract management, FM, and E&S; as well as training. To strengthen the capacity of the Rogun PMG in implementation of projects financed by IFIs, the following specialists have been hired under the Rogun TA: project coordinator, procurement specialist, financial management specialist, senior E&S advisor with international experience, local E&S specialist, monitoring and evaluation specialist, and a translator. Those specialists were hired under terms of reference satisfactory to the Bank with duration of contracts to be determined based on needs and those might be involved in the implementation of activities under the proposed project. In addition to its primary function, Rogun PMG is also responsible for coordination of the activities with various ministries, departments and international financial organizations in the implementation of the state policy of the Government related to issues related to the construction of energy facilities and their upgrade in accordance with the programs of socio-economic development of the Republic of Tajikistan.

3. The DFZ will function as the Resettlement Unit and will be primarily responsible for RAP and LRP implementation under Component 3.1, as well as reviewing the relevant documents, reports, and outputs to be produced by the consultants to be hired by Rogun PMG.

4. Rogun OJSC will be a co-signatory on contracts and will be the owner of the assets to be financed through the project. Rogun PMG and OJSC will be involved in reviewing and approving the contractual, technical, E&S recommendations and advice to be provided by the contractors and consultants hired by Rogun PMG.

5. Rogun OJSC team and the DFZ, will continue to be involved in reviewing the relevant documents, reports, and outputs e.g., from the Rogun TA Project activities. They will continue to review and approve the contractual, technical, environmental, and social recommendations and advice to be provided by the firms hired by Rogun PMG.

Table 1.1: Overview of implementation arrangements of the Project

	Rogun OJSC	Rogun PMG	DFZ
Key responsibilities	Permanent legal entity, responsible for • Construction and operation of the 3,780 MW Rogun HPP project. • Signs major civil works contracts and provides acceptance of works. • Signs PPAs with off-takers, and collects revenues, and provides a portion of project revenues to finance capex. • Rogun OJSC will be the ultimate owner of assets financed through the Project.	Temporary legal entity for construction period, responsible for • Coordination of the activities with various ministries, departments and international financial organizations. • Manages procurement and contract management process for all project components.	Temporary legal entity for construction period, primarily responsible for managing resettlement and livelihood restoration activities.
Founding decree	Decision No. 454, dated August 31, 2007 and Decision No. 685 dated December 30, 2009	President's Decree No.1361, dated October 20, 2012	President's Decree No. 3, dated January 6, 2011
Project implementation responsibility	Co-sign works contracts, review and acceptance of technical aspects, and own/maintain/operate the assets.	Components 1, 2, 3.2 and 4.	Component 3.1.
Approximate number of staff (June 2023)	34	44	47
Additional details	• Focus of the Bank governance assessment.	• Project Implementing Entity for the Rogun TA Project. • No legal relationship with OJSC.	• Will manage RAP and LRP implementation process.

6. A detailed implementation and project supervision plan was agreed during project appraisal, taking into account the project scale and complexity, particularly considering financing from multiple donors each with their own set of project preparation and implementation requirements. There will be standard reporting templates from the PMC to report on technical, procurement, contract management, financial management, E&S aspects, as well as an agreement to conduct joint supervision missions with a clear and predictable schedule. An additional effort from the Bank team will be required to supervise sub-component 3.1, including cash payments to vast amount of beneficiaries for the involuntary resettlement and cash stipends.

7. The close collaboration between DPs during project preparation will continue during project implementation. IDA is expected enter into a co-lender's agreement for with AIIB (for Lots 1 and 3A), ADB and EIB and other co-financiers (for Lot 3A), and other DPs, as applicable. The co-lenders agreements will detail joint supervision arrangements including joint supervision missions, approach to the supervision of technical, E&S aspects, and financial management aspects. To maximize the efficiency of project supervision, the IFIs are expected to be supported by an independent Technical Advisor (expected to be co-financed by the ADB, AIIB and EIB).

8. CSOs are expected to play a critical role supporting and monitoring the implementation of the resettlement and livelihood restoration measures. CSOs, particularly women's groups, are already providing input into the development of livelihood restoration programs, with a focus on small businesses and childcare, and future consultations will prioritize improved access to economic opportunities for resettled communities, including through gender-sensitive approaches. This work is led by DFZ, with support from the Ministry of Labor, Migration and Employment of Population, and other ministries.

9. Independent third-party monitors will be engaged to audit resettlement and livelihood restoration activities under the RAP 2/LRP 2 and future RAPs/LRPs. It may be possible that CSOs (both local and international) could be hired for the purpose of monitoring the RAP/LRP implementation. This procurement process will be led by PMG and the World Bank will work closely with PMG to ensure transparency in the hiring process for the RAP 2/LRP 2 monitor.

Strategy and Approach for Implementation Support

10. This Implementation Support Plan (ISP) for the Project describes how the Bank will assist the client in achieving the PDO of the project. In particular, the ISP places emphasis on accomplishing the following objectives: (a) providing necessary technical advice to the client and bringing international experience and good practices to promote successful implementation; (b) ensuring that project investments meet the Bank's technical standards; (c) oversight and capacity building support for Rogun PMG, OJSC and HPP staff; and (d) ensuring that the required fiduciary, social, and environmental safeguards are put in place and implemented according to the financing agreement and other project documents.

11. **Implementation support**. The Bank team will provide just-in-time implementation support to Rogun PMG and OJSC on issues that may arise during project implementation, including advice from hydropower specialist, hydro-mechanical specialist, power engineer, and civil engineer. Implementation support missions will be carried out two times a year. The project team will also carry out regular site visits to Rogun HPP site.

12. **FM implementation support.** As part of its project implementation support and supervision missions, the Bank will conduct risk-based FM implementation support and supervisions at regular intervals. The areas of higher risk subject to more in-depth supervision will include the mechanism of verification that assets have been transferred and accounted for in the Rogun HPP accounting records in the correct amounts; making cash payments to resettled people and stipends' beneficiaries as implemented by DFZ; the correct allocation of invoice payments between the Bank and AIIB under PMG; and the technical assistance support provided to Rogun HPP to improve its corporate governance and financial management.

13. **Procurement implementation support**. Bank implementation support activities are based on the project procurement risks identified and include: identifying emerging risks in procurement, providing procurement trainings for staff of implementing entity; prior/post review of procurement documents, providing timely feedback to Rogun PMG; providing detailed guidance on the Procurement Regulations; and monitoring procurement and contract management processes through STEP and monthly/quarterly reports.

14. **E&S**. The Bank's E&S specialists will provide HEIS to Rogun PMG and DFZ to support the finalization and implementation of ESIA/ESMP, RLRF/RAP, LMP, and SEP and other E&S management plans under the project. The Bank team will also provide guidance on resolution of safeguards issues and timely response and clarifications on safeguards related questions and issues.

Implementation Support Plan and Resource Requirements

15. The proposed implementation support requirements are described in Tables 1.2 and 1.3.

Table 1.2: Implementation Support Requirements

Focus	Skills Needed
Coordination of the support and guidance to Rogun OJSC on technical, contract management, project implementation, E&S, FM and procurement issues.	Project management
Advice on technical issues related to rehabilitation of generating units and monitoring of civil works.	Hydropower expert

Focus	Skills Needed
Advice on technical issues related to rehabilitation and refurbishment of the balance of the plant and monitoring of civil works.	Hydro-mechanical expert
Review of the E&S requirements in procurement documents and overall implementation of E&S requirements;	Environmental specialist Social specialist
Monitoring of implementation of E&S instruments under the project.	E&S specialists
Review of the compliance with legal covenants regarding the GBV/SEA/SH Action Plan and the Gender Action Plan	Gender specialist
Advise on procurement, and contract management related matters;	Procurement specialist
Advise on financial management, and disbursement related matters;	Financial management specialist
Review of the compliance with legal covenants under the legal agreements.	Financial management specialist
Guidance on implementation of citizen engagement and gender related activities.	Financial officer/disbursements
Review of compliance with legal covenants under the legal agreements regarding the E&S instruments.	E&S specialists

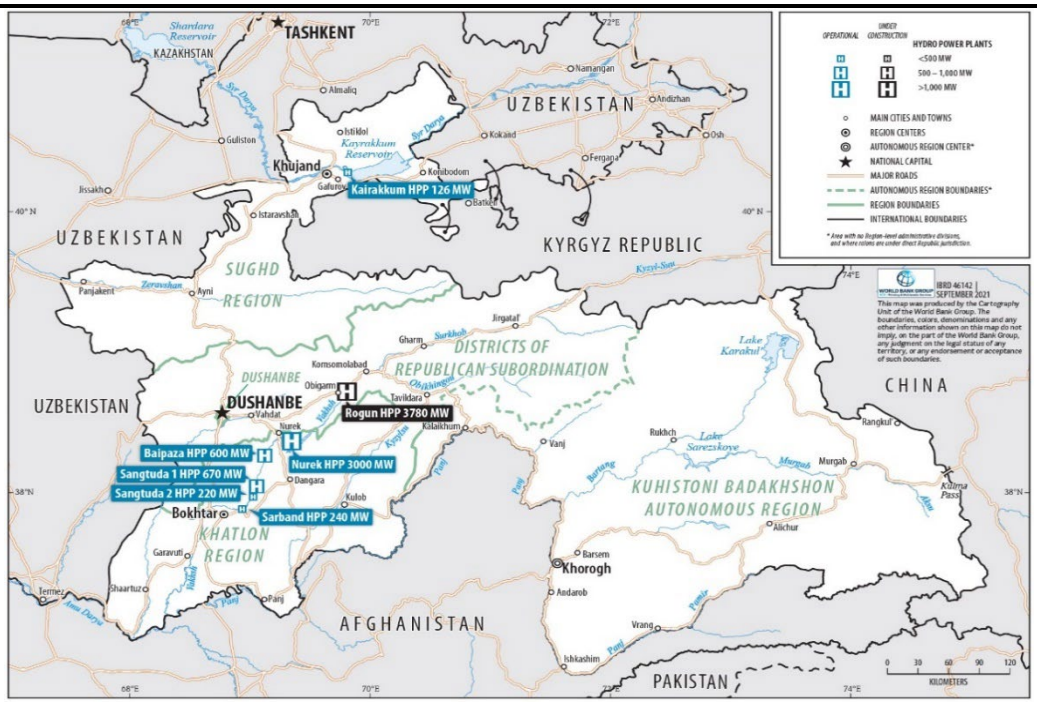
Table 1.3: Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Team leader	140	30	Headquarter (HQ) based
Hydropower expert	100	20	International consultant
Hydro-mechanical expert	80	20	International consultant
Power engineer	40	10	HQ based
Road/transport engineer	20	4	International consultant
Civil engineer	10	2	International consultant
Procurement specialist	20	10	Region based
Financial management specialist	30	-	Country office based
Disbursement specialist	10	-	Region/country based
Environmental specialist	20	8	HQ and Region based
Social specialist	30	10	HQ and Region based
Gender specialist	10	4	Region
Financial analyst	20	8	Region based

ANNEX 3: Snapshot of Rogun HPP project

1. The project is located on the Vakhsh River upstream of the Nurek HPP, with a large reservoir capable of providing seasonal regulation.

Figure 2.1: Map: Vakhsh Cascade of HPPs



Source: World Bank.

2. **The key characteristics of the project are the following:**
   (a) Location: Vakhsh River, first project in the cascade upstream of the 3,000 MW Nurek HPP
   (b) Dam: rock-filled dam with a central impervious core
   (c) Dam crest: El. 1,300 masl
   (d) Full supply level: El. 1,290 masl
   (e) Foundation level: ~965 masl
   (f) Dam height: 335 m
   (g) Installed capacity: 3,780 MW (6 x 630 MW)
   (h) A staged construction has been planned in order to generate energy during the construction phase. A smaller dam embedded in the main one allows raising the reservoir level before dam completion. This is the Stage 1 dam which has a crest elevation of 1,120 masl.
   (i) Expected annual average generation (at fully supply level): 14,400 GWh
   (j) Surface Spillway: 7,800 m^3/sec (PMF)
   (k) Total reservoir capacity: 13.3 km^3
   (l) Reservoir active storage: 10.3 km^3
   (m) Reservoir area: 110 km^2
   (n) Reservoir operating lifespan: 115 years (based on the estimated sediment inflow)
   (o) Project start: 1976; stopped during early 1990s, resumed in 2007

(p) Project owner: Rogun OJSC
(q) Ownership structure of Rogun OJSC: 97 percent Republic of Tajikistan; 3 percent - various domestic legal entities and individuals.

ANNEX 4: Rogun HPP Development Overview

1. Table 3.1 provides a snapshot of key development milestones in the Rogun HPP, originally designed in the mid-1960s. Construction progressed with number of stop-and-resume cycles driven by economic consequences of a major geopolitical event - dissolution of the Soviet Union - and the calamities caused by the civil war in Tajikistan in 1990s. Small-scale construction activities resumed in 2007 with financing from the state budget and accelerated in 2016 with selection of the contractor for the Main Dam - Webuild (Italy), with construction activities ramping up since 2017. Rogun HPP is currently operating with two temporary turbines (400 MW capacity).

Table 3.1: Snapshot of Rogun HPP Project Development Milestones

Milestones	Dates
Field investigations and surveys of the Project started	1967
Construction activities started	1976
Vast majority of geological and geotechnical investigations completed	1978
Construction discontinued due to collapse of Soviet Union and civil war in Tajikistan	1992
Small-scale construction activities resumed	2007
Techno-Economic Assessment Study (TEAS) under the World Bank project	2011-2014
International tender for procurement of contractors for main lots launched	2015
Contract for construction of the Main Dam signed with Webuild (Italy)	2016
Contract for design, supply, and installation of electromechanical equipment (Voith Hydro, Austria) signed	2021
Contract for construction of the Right Bank Structures (Lot 3) signed with TGEM (Tajikistan)	2021

Source: World Bank team based on data from Rogun PMG.

2. **Following the Government's request, the Bank in 2011-2014 supported** (i) preparation of TEAS for Rogun HPP Project; (ii) development of E&S instruments e.g., ESIA; (iii) two independent panels of experts (one on dam safety, and one on E&S) to provide advice for the studies. The assessment study was undertaken in three phases.

(a) Phase 0 was an assessment of the potential impact of the salt wedge that exists at the Rogun site. It was concluded that this impact can be addressed by appropriate mitigation measures to ensure the long-term safety of the proposed dam.

(b) Phase I was an assessment of all previous work done to date on the Rogun HPP site. It was concluded that, with implementation of specified remedial measures, the existing facilities and equipment were suitable for use in the project.

(c) Phase II was a techno-economic assessment of different Project alternatives. Three FSLs were studied corresponding to dam heights of 335 m, 300 m and 265 m respectively. Three generation capacities were studied for each FSL (ranging from 3,600 MW to 2,000 MW), resulting in a total of nine Project alternatives. The technical analysis concluded that, subject to specified design modifications and the implementation of the identified mitigation and monitoring measures, any of the Project alternatives could be built and operated within international safety norms. The E&S analysis showed that the E&S impacts of all three alternatives could be adequately mitigated. The economic analysis showed that all Project alternatives would have an overall beneficial impact on the Tajikistan electricity system across all sensitivities, with the highest dam alternative generally showing the greatest benefit.

3. Considering the long duration of the construction period for all the proposed dam alternatives, an early impounding and early generation concept was adopted for all alternatives. A smaller Stage 1 Dam, embedded in the Main Dam, allows raising the reservoir level before dam completion. A temporary power intake and two temporary units were designed to make this early generation possible. This allows for the early generation of benefits during the lengthy implementation stage of the project. Early generation at low head with Units 6 and 5 has been ongoing since 2018 and 2019 respectively.

4. A sedimentation study estimated that the ultimate life span of the Rogun reservoir is in the range of 115 years. Furthermore, construction of Rogun will largely decrease the Nurek reservoir sediment filling rate, ensuring continued river regulation for a significant additional period of time.

5. The Rogun assessment studies included preparation of the broad framework of an EPP, with the EPP itself to be prepared prior to reservoir filling.

6. After the completion of the assessment studies, the Government decided to pursue construction of the Rogun HPP for the alternative with the highest dam (335 m) and the largest generation capacity (3,600 MW). The generation capacity was subsequently increased slightly to 3,780 MW.

7. An Employer's Representative (ER, a joint venture of Tractebel Engineering and Electroconsult) was hired and further design work was undertaken. Bidding documents were prepared by the ER for four engineering-procurement-construction (EPC) lots: Electro-mechanical Equipment (Lot 1), Main Dam (Lot 2), Right Bank Structures (Lot 3), and Left Bank Structures (Lot 4). Salini Impregilo (now reconstituted as Webuild) was awarded the contract for Lot 2, with the contract being signed on July 1, 2016. Award of the other three lots was delayed due to financing constraints. The contracts for Lot 1 and Lot 3 were awarded in 2021 to Voith Hydro and Tojikgidroelektromontaj (TGEM) respectively, whereas the contract for Lot 4 has not yet been awarded.

8. Project implementation was resumed in 2015 with financing from the Government. The pace of implementation has been impacted by the availability of financial resources, leading to slow construction exposing the Project to significant risks, for instance from floods, earthquakes, landslides and sedimentation.

9. The optimized Project construction schedule developed during the TEAS was based on a substantial amount of works being completed and/or initiated prior to awarding the main construction contracts. These Pre-Contract Works (PCW) included constructing a third diversion tunnel DT3. Most of these works have already been implemented through a number of different Tajik and regional contractors. In order to mitigate the impact of the delayed award of the contract for Lot 4 on the overall implementation schedule, some of these contractors have been undertaking a variety of works that are collectively called Lot 4 Early Works. These include works related to the main power intakes (shafts, penstocks, etc.) and slope stabilization in the power intakes area. Table 3.2 summarizes the major construction contracts and their implementation status as of December 2023.

Table 3.2: Main Contracts under component 1[34]

Packages and Contracts	Main Scope	Contractor	Estimated Cost[35]	Contract Status	Progress (as of October 2024)
Lot 1: Electro-mechanical equipment	Design and supply of replacement runners for Generating Units 5 and 6 and design, supply, and installation of electro-mechanical equipment for Generating Units, including turbines, generators, frequency governor, excitation system, electrical systems, unit-related monitoring system, cooling water system, compressed air	Voith Hydro (Austria)	EUR 471 million (US$527 million equivalent)	Under implementation	10 percent of contractual scope

[34] Excluding pre-contract works which have been completed.
[35] Total contract cost, including physical and price contingencies.

Packages and Contracts	Main Scope	Contractor	Estimated Cost[35]	Contract Status	Progress (as of October 2024)
	system for the governor, fire detection and suppression systems.				
Lot 1A: Additional electro-mechanical equipment and powerhouse works	Installation of replacement runners for Generating Units 5 and 6 and other turbine rehabilitation works and control system integration.	TBC	US$20 M (estimated)	Not awarded yet: to be tendered – expected award mid-2025	0 percent
Lot 1B: Additional Electro-Mechanical Equipment	Design, supply and installation of replacement generators for Units 5 & 6	TBC	US$100 M (estimated)	Not awarded yet: to be tendered – expected award 2029	0 percent
Lot 2: Main dam	Construction of the dam for Rogun HPP, including treatment of the salt wedge and grouting of the foundation and abutments.	Webuild (Italy)	US$2.5 billion	Under implementation	44 percent of contractual scope
Lot 3: right bank structures early works	(a) site investigations and slope stabilization for atypical zone and the plunge pool; (b) site investigations for high level outlet structures 1 and for overflow spillways; (c) construction activities on: (i) access roads, tunnels, and bridges; (ii) Diversion Tunnel 4, including flip bucket and hydraulic steel structures; and (iii) construction of right bank grouting galleries from level 1 to level 4 and grouting for the right bank grout curtain from level 1 to level 3; and (d) related design works.	TGEM (Tajikistan)	US$457 million[36]	Under implementation	60 percent of revised scope
Lot 3A: Full scope of right bank structures	Construction of right bank structures, including: (a) high level outlet structures 1 and 2; (b) overflow spillways; (c) hydraulic steel structures for high level outlet structures 1 and 2 and overflow spillways; (d) plunge pool; and (e) right bank grouting galleries from level 5 to 6 and grouting for	To be procured	US$1.4 billion	Procurement process expected to start in 2024	0 percent

[36] To be confirmed as the division of scope between Lot 3 and new Lot 3A is finalized.

Packages and Contracts	Main Scope	Contractor	Estimated Cost[35]	Contract Status	Progress (as of October 2024)
	the right bank grout curtain from levels 4 to 6.				
Lot 4 Early Works (EW)	Excavation and stabilization of the left bank slope, excavations for the headrace tunnels and shafts, urgent first-stage concreting in the powerhouse and transformer caverns, grouting galleries and grouting works.	Various small contractors	US$474 million	Under implementation	55 percent of contractual scope
Lot 4: Left bank structures	Development of remaining structures on the left bank, including construction and concreting of permanent intakes of the powerhouse complex and associated upstream waterways, headrace tunnels, gate shafts, penstocks, hydromechanical equipment, remaining powerhouse and transformer hall civil works, balance of plant (BOP) auxiliary systems, concreting of installations for the generating units, and the tailrace tunnels.	To be procured	US$850 million	Procurement process underway	0 percent
Control room	Purchase and installation of equipment for central control room, and monitoring control equipment for Generating Units 1-6.	Rakurs	US$13 million	Contract signed	0 percent

10. In addition to the construction contracts, AFRY is to execute a contract for the engineering design of the works to be constructed under Lot 4 and Lot 3A, and Tractebel-ELC is performing ER services for Lots 1, 2 and 3, limited ER services for Lot 4 Early Works (design review and progress monitoring), and design review services for Lot 4, whereas the Rogun OJSC itself undertakes all of the remaining project management tasks. The E&S supervision by the ER covered only Lot 2 until mid-2023 but has since covered Lots 1 and 3 also. The E&S supervision for the remaining works has been carried out by the Employer. There is a condition of effectiveness related to the expansion of the scope of the ER for E&S supervision or hiring of PMC (whichever comes first).

11. Providing adequate flood discharge capacity for different construction stages and for the operation phase is a complex issue for Rogun due to a variety of factors. First of all, the height of the dam requires at least three levels of discharge structures as the head on the gates has to be limited to 150 m. Safety considerations require that floods are discharged by at least two independent structures. Such considerations result in six tunnels with inlets at different elevations and two first stage surface spillways. In addition, it is foreseen that when the reservoir has eventually silted up, attenuation will no longer be possible and additional spillway capacity will be required. This can be provided by two remote tunnel spillways, but other options are under consideration.

12. Except for the two diversion tunnels DT1 and DT2 that are constructed through the left abutment, all of these structures are to be constructed through the right abutment. The geology of the right abutment is a constraint, as there is a large geologically atypical zone (ATPZ) about 2 km long and 1.5 km wide. The thickness of the ATPZ ranges up to 150 m. Fitting all of these structures in the right abutment is a challenge, especially the outlet structures with their energy dissipation devices. Recent design studies are re-evaluating the overall flood discharge arrangements and some modifications in the arrangements are being undertaken.

13. Under the provisions of the Lot 2 Contract, the management of the inflows is the responsibility of the Lot 2 Contractor. Thus, the various discharge structures are to be constructed by the Lot 3/3A Contractors, handed over to the Employer and then taken over for operation and maintenance by the Lot 2 Contractor. However, Webuild did not take over Tunnel DT3 after its completion in 2019 due to reservations about design and construction aspects, and DT3 has been operated and maintained by the Employer. This has potential contractual and insurance implications. Discussion has now resumed between the Employer and Webuild to seek a solution to this issue.

14. The Main Dam itself is a rockfill dam with a central impervious core and it has been designed to withstand a 10,000-year Safety Evaluation Earthquake (SEE) with a peak ground acceleration (PGA) of 1.08g and the Probable Maximum Flood (7,800 m3/s).

15. The existing Nurek dam downstream of Rogun as well as the other projects of the Vakhsh cascade are not designed to withstand the PMF, and the Rogun Dam will provide the major additional benefit of also protecting the entire downstream cascade, including Nurek, by using the storage capacity available in the Rogun reservoir to attenuate the PMF to the maximum design flood (1 in 10,000 year) for Nurek (5,400 m3/s). It is envisaged that coordinated operation of the Rogun and Nurek reservoirs will also allow enhanced energy generation.

16. In April 2020, the President of Tajikistan requested the Bank to evaluate the options for financing the completion of the Project in a sustainable manner. The Bank commissioned a Financing Options Study in response to this request. The Financing Options Study was prepared by Bank staff with input from external consultants.

17. The Financing Options Study focused on various aspects of the Project, including an overview of the implementation progress. This included obtaining an update on the construction status, carrying out an overview of the main contracts and of implementation issues, and high-level recommendations to address them. The Financing Options Study presented an outline of the typical requirements of international development partners that would need to be fulfilled by the Government and Rogun OJSC to enable consideration for financing the Project.

18. This study was shared with the Government in November 2021 and subsequently with other Development Partners. Development Partners expressed their interest in the Project during a high-level roundtable organized by the Government on December 7, 2022. The Government and the World Bank team presented the findings from the study. The outcomes and conclusions were endorsed by the potential financiers including the list of issues that need to be addressed to increase the likelihood of the Project to secure financing.

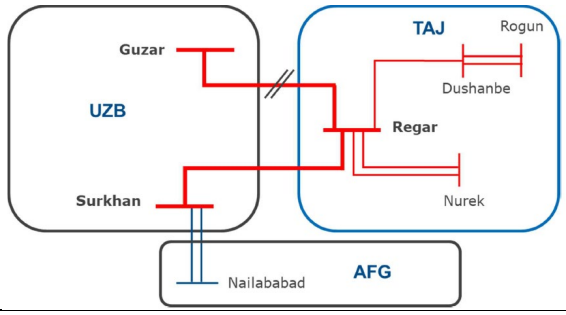
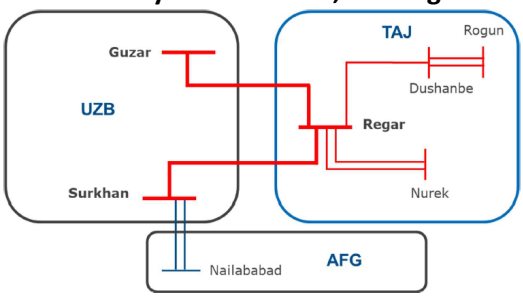
19. As far as design and construction activities are concerned, some activities are being financed under the Rogun TA Project (see Annex 5).

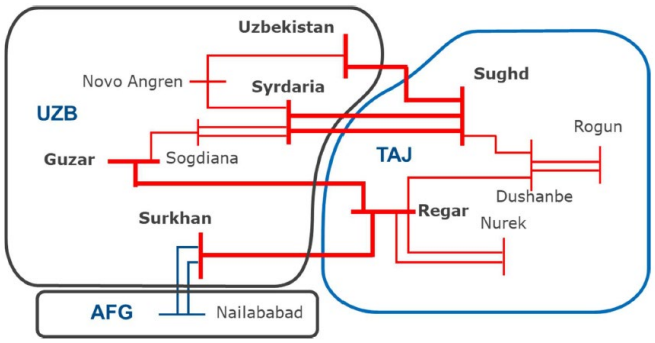
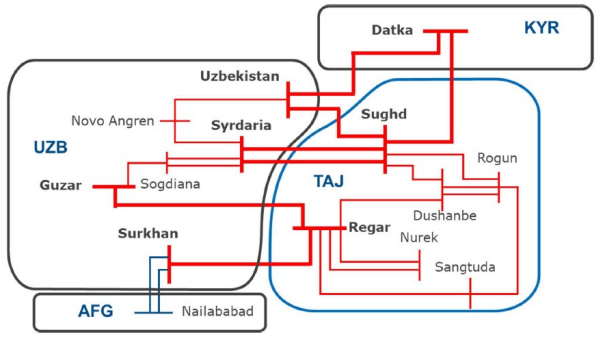
20. The key milestones established in OIP (Revision H, March 2024) are as follows – however it is expected that there will be some further delays in these milestones as design and construction delays have occurred:

Completion of Diversion Tunnel 4 (DT4)	October 2026
Completion of the plunge pool	April 2028
Main Dam construction up to 1110 masl (Partial)	September 2026
Reservoir impoundment to 1100 masl	October 2026

Unit 6 Runner replacement	September 2026
Unit 5 Runner replacement	December 2026
Main Dam construction up to 1185 masl (Partial)	October 2028
Reservoir impoundment to 1175 masl	October 2028
Unit 4 commissioning	October 2028
Unit 3 commissioning	January 2029
Completion of High Level Outlet Structure 1 (HLO1)	October 2028
Completion of High Level Outlet Structure 2 (HLO2)	June 2032
Completion of Overflow Spillways (OVS)	November 2033
Unit 2 commissioning	December 2029
Unit 1 commissioning	February 2030
Reservoir impoundment to 1230 masl	June 2032
Unit 6 Generator replacement	May 2031
Unit 5 Generator replacement	January 2032
Main Dam completion up to 1300 masl	December 2032
Reservoir impoundment to 1290 masl	June 2038

Table 3.3: Cross-border exchange capacity assessment

Current Situation 	The transfer capacity from TAJ to KAZ through Uzbekistan and Kyrgyzstan is at least 2,200 MW in the current situation. This is twice the average transfer capacity needed for Rogun HPP to export 5 GWh to Kazakhstan over a yearly six-month period.
2024 – CAPS synchronization, 1st stage 	Considering that Rogun will not have reached a capacity of over 800 MW before 2027, the first stage of synchronization with CAPS will ensure sufficient cross border capacity, and the energy exchange will be limited by Rogun's generation capacity. The cross-border power lines will allow exporting up to 28 MWh a day, which corresponds to 864 MWh a month, and just more than 10 GWh a year.
2027 – CAPS synchronization completed	With a generation capacity for Rogun of below 1,400 MW, the planned grid reinforcement linked to CAPS synchronization will

	ensure sufficient cross border capacity (1,200 MW in the south and 2,000 MW in the north). The energy exchange will be limited accordingly to Rogun's generation capacity, but not by the cross-border exchange capacity that would allow exchanging up to 76 MWh a day, which corresponds to 2,3 GWh monthly and 27,6 GWh yearly.
2038 – Rogun at full capacity 	With Rogun at full capacity, the planned grid reinforcement linked to CAPS synchronization and CASA 1,000 will ensure sufficient cross border capacity (1,200 MW in the south and 3,400 in the north). The energy exchange will be limited accordingly to Rogun's generation capacity. The cross-border capacity would allow to exchange 115 MWh a day, which corresponds to 3.5 GWh a month and 42 GWh a year.

ANNEX 5: Scope of Technical Assistance for Financing Framework for Rogun Hydropower Project (P178819)

1. **PDO**. The project development objectives are to strengthen Rogun HPP Project's financial and commercial frameworks, enhance its E&S sustainability, improve the transparency, and support establishment of Rogun HPP Project's BSP.

2. **Scope.** The TA Project has the following main components.

Component 1: Development of a macroeconomically sustainable financing plan and a commercial framework for Rogun HPP Project (estimated cost of about US$4.8 million financed with IDA grant of US$3.6 million and AIIB grant of US$1.2 million). This component is financing:

(a) Revision of the Rogun HPP Project construction completion schedule taking into account the existing and projected macro-fiscal framework of the country.
(b) Preparation of the Rogun HPP Project financing plan taking into account the updated construction completion schedule.
(c) Transaction advisory services to help the Government draft, negotiate, and sign long-term PPAs for sale of Rogun HPP electricity.
(d) Update of the economic analysis of Rogun HPP Project.
(e) Preparation of additional economic and financial assessments and studies that may be required for the needs of the Rogun HPP Project.
(f) Development of tariff reform program for electricity sector.
(g) Implementation of energy efficiency audit(s) of large state-owned industrial consumers and development of energy efficiency program for such state-owned enterprise consumers with the objective of reducing the energy consumption without material impact on competitiveness.

Component 2: Improvement of the dam safety (estimated cost of about US$4 million financed with IDA grant of US$3.2 million and AIIB grant of US$0.8 million). This component is financing:

(a) DSPOE. The DSPOE conducts due diligence of existing design and project solutions, provide high level and professional independent advice and guidance to support objectivity and credibility in the development and implementation of designs and in the construction of the Rogun HPP Project, and share technical expertise and knowledge and so contribute to dialogue amongst the various stakeholders.

(b) Review of existing contracts and preparation of procurement documents.

(c) Additional technical and engineering studies and consultancy services that may be required for various technical aspects of the Rogun HPP Project and preparation of procurement documents. The scope of those studies will be developed after dam safety POE completes its due diligence on existing designs and project solutions.

Component 3: Strengthening of E&S framework and benefit sharing aspects of Rogun HPP Project (estimated cost of about US$7 million financed with IDA grant of US$4.2 million and AIIB grant of US$2.8 million). This component is financing:

(a) Update of E&S instruments for Rogun HPP to align them with the requirements of the World Bank's ESF.
(b) Assistance to Rogun PMG in developing a Contractor Management Plan that will include the details of how Rogun PMG will supervise the E&S performance of its contractors; and development of recommendations on ensuring compliance of contracts with E&S standards and requirements.

(c) E&S POE[37] with a mandate to provide professional advice and guidance on E&S aspects of the Rogun HPP.
(d) Design of a BSP that would contribute to equitable development and sustainable socio-economic growth at the local and national levels, which would allow to use part of the Rogun HPP revenues from electricity sale for various economic and social activities and initiatives.
(e) Administration of the BSP and other E&S studies and assessments that may be required for Rogun HPP.

Component 4: Strengthening of institutional capacity of Rogun PMG and Rogun OJSC (estimated cost of about US$4.2 million financed with IDA grant of US$4 million and AIIB grant of US$0.2 million). This component is financing:

(a) Corporate governance review of energy SOEs, including Rogun OJSC, and development of recommendations to align those with best international practices.
(b) Capacity building, including training, for the Rogun PMG and Rogun OJSC staff in dam safety, operation and management of hydro facilities, and project management.
(c) Public communication support to the Government, Rogun PMG and Rogun OJSC.
(d) Purchase of information and communication technologies and office equipment for Rogun PMG and Rogun OJSC.
(e) Project financial audits and incremental operating costs of Rogun PMG.

3. **Closing date:** December 31, 2026.

4. **The main achievements to date are summarized below:**
(a) **Design of the BSP**. The design of BSP is underway. Core BSP principles have been prepared and were approved through a government decree (Decree No. 27, dated January 29, 2024). Detailed design is expected to be completed in early 2025.
(b) **Appointment of DSPOE**. An eight-member DSPOE was established in 2023 and tasked with ensuring due diligence and international quality standards in the design and construction of the project and the start of operations. The DSPOE made several important recommendations regarding technical risk mitigation measures and these are being integrated into the detailed design and the construction and monitoring procedures.
(c) **Appointment of ESPOE**. The ESPOE has been appointed and is reviewing the updated E&S instruments and providing guidance to PMG on ongoing E&S issues.
(d) **Update of E&S instruments**. The update of the E&S instruments, which were developed as part of the Bank financed Techno-Economic Assessment Studies (TEAS) in 2011-2014, has been finalized and the following documents have been approved by the World Bank and publicly disclosed: (a) the draft ESIA including the ESMP was disclosed on December 22, 2023; (b) the Resettlement and Livelihood Restoration Management Framework (RLRF), Stakeholder Engagement Plan (SEP), Labor Management Plan (LMP), and Gender Action Plan (GAP) have also been finalized and disclosed prior to appraisal.
(e) **Optimized OIP and financial plan**. The objective of the OIP is to develop an optimized project implementation completion plan for the project that is technically feasible and macroeconomically sustainable. The financing plan was designed with the view of maintaining macro-fiscal stability. It is now being finalized and the DSA confirmed that the project is not expected to add major public debt distress risk for Tajikistan.
(f) **Development of commercial framework for the Project.** The Government has signed a PPA with Uzbekistan and a term sheet with Kazakhstan (with PPA expected to be signed shortly) for long-term supply of Rogun's electricity to Uzbekistan and Kazakhstan. The PPAs ensure the adequacy and predictability of cash flows to

[37] The Government committed to finance the E&S POE cost after the completion date of the proposed TA Project.

service the debt.

(g) **Audit of quality control (QC) and quality assurance (QA) systems of the Project**. This activity assessed the robustness of civil works completed to date, which is an important decision factor for financiers considering that they are entering the Program mid-stream. The assessment is underway, with review of QA/QC documents completed and follow up physical assessments planned where QA/QC documentation was inadequate, which will be reviewed by the DSPOE for any remedial actions that may be needed.

(h) **Independent Assessment of Diversion Tunnels (DT) 1-3**. Following a recommendation from the DSPOE, the Rogun TA Project is financing an independent assessment of DTs 1-3. The assessment reviewed the design and construction quality to confirm their capacity to safely handle construction floods and identify any remedial measures that may be needed. Tunnel inspections and design review phases have been completed and remedial actions including cost estimates will be prepared by effectiveness.

(i) **Additional dam safety studies**. Work is well advanced to fulfill the requirements of ESS4 for the development of the following Dam Safety Plans: plan for construction supervision and quality assurance, instrumentation plan, operation and maintenance (O&M) plan, and the emergency preparedness plan (EPP). Additional studies underway and expected to be concluded end 2024/early 2025 include: (i) an update to the Seismic Study; (ii) an update to the climate change and hydrology study; and (iii) an update to the sedimentation study.

ANNEX 6: Details of Electricity Sector Background and Context

1. **The electricity sector in Tajikistan is comprised of two state-owned electricity generation companies, two independent power producers (IPPs), electricity transmission and distribution companies, and a concession in Gorno-Badakhshan Autonomous Oblast (GBAO) combining electricity generation, transmission, and distribution**. In June 2019, the Government unbundled the vertically integrated Barqi Tojik OJSC (BT) and established the new state-owned electricity transmission (Shabakahoi Intiqoli Barq (SIB) OJSC)) and distribution (Shabakahoi Taqsimoti Barq (STB) OJSC) companies. The new companies are legally separate and independent:

(a) BT, the largest state-owned generation company, continues to own and operate all state-owned electricity generation plants except for Rogun HPP and the ones in GBAO. It is also responsible for the electricity market operation. The two IPPs, Sangtuda-1 and Sangtuda-2 HPPs, were constructed with investments from Russian and Iranian state-owned companies respectively and supply electricity to BT under 20-year PPAs.

(b) SIB owns and operates the high-voltage overhead transmission lines and substations of 110 kV voltage levels above and is responsible for electricity transmission and dispatch services in all regions of the country except GBAO.

(c) STB owns and operates the distribution-level infrastructure comprised of distribution lines at 0.4 kV - 35 kV range and the distribution substations and is also responsible for electricity supply to all consumers in all regions of the country except for GBAO.

(d) Pamir Energy Company (PEC) generates and supplies electricity to around 245,000 people in GBAO under a 25-year concession agreement expiring in 2027.

2. **The electricity supply mix of Tajikistan is dominated by hydropower and therefore affected by seasonality and climate change**. The total existing generation capacity is currently 6,100 MW, of which about 88 percent is hydropower and 12 percent thermal power, the latter primarily operated in the winter to supply electricity and heat[38]. The Nurek HPP (3,000 MW), with a seasonal reservoir, is currently the largest generating plant which currently accounts for about 50 percent of the total supply. The generation from HPPs reduces in winter due to reduced river flows. After commissioning of the Rogun HPP, with its full installed capacity of 3,780 MW and full supply level of reservoir, it will be the largest HPP in Tajikistan. Rogun HPP is currently operating with two temporary turbines (400 MW capacity).

5. **The power sector in Tajikistan will continue playing a major role as an important pillar of export-oriented economy**. It is not only a service essential for social development and economic activity in the country but also an important building block of the Government's objectives to develop an export-oriented economy consistent with the National Development Strategy 2030. In particular, the power sector is well-positioned to further expand exports of electricity to the broader CA region. Thus, the Government has committed to continue its efforts to address the main challenges facing the power sector.

6. **The Government has been making good progress in addressing the key challenges facing the power sector**. Major projects and programs have been initiated to tackle the challenges of financial distress of the powers sector, reduction of electricity supply reliability, variability of electricity generation due to excessive reliance on hydropower and limited regional connectivity. Examples include:

(a) ***Challenge: unreliable electricity supply*.** The financial distress of the power sector coupled with lack of firm generation capacity in winter, when demand for electricity is the highest driven by heating needs, impacted the reliability of electricity supply, which deteriorated due to obsolescence and under-

[38] A study, under a Bank Executed Trust Fund, is ongoing to identify options for sustainable heating in Tajikistan.

maintenance of main HPPs as well as transmission and distribution networks, which increased frequency of asset failures with reduction in the quality of supply for electricity consumers.

(b) ***Achievements to date.*** The Government: (a) continued construction of Rogun HPP from the state budget and commissioned the first two temporary ***units*** in 2018 and 2019 to help address winter electricity shortages and generate revenues for construction of the project; (b) attracted financing from various DPs to start rehabilitation of large HPPs – Nurek, Qairokkum, and Sarband – accounting for 60 percent of total generation; and completed construction of 400 MW Dushanbe-2 combined heat and power plant; and (c) started preparation of a utility-scale 200 MW solar PV project in the North to be implemented with support from the World Bank and engagement of the private sector

(c) ***Challenge: Limited connectivity***. Following independence in 1991, Tajikistan continued to be a member of the CAPS, through which the five CA countries optimized the use of fossil fuel and hydropower resources that are unevenly distributed among those ***countries***. Moreover, Tajikistan was not able to fully capitalize on supply opportunities that existed in South Asia region with Afghanistan and Pakistan requiring additional electricity supply to meet the growing demand.

(d) ***Achievements to date.*** Tajikistan made significant progress in increasing the exports from around 1,300 GWh in 2017 (approximately 9 percent of total energy sales) to about 2,500 GWh in 2023 (approximately 16 percent of total energy sales). The Government introduced an ambitious program for expanding the regional connectivity to allow for increased exports and ***diversification*** of electricity export markets: (a) CASA-1000, which is expected to be completed by mid-2027[39] and which would allow Tajikistan to export about 2,800 GWh of electricity to Afghanistan and Pakistan during the months of May-September when there is hydropower surplus; and (b) reconnection to the CAPS allowing Tajikistan to expand export opportunities (starting from 2024) using the existing 220 kV and 550 kV transmission lines with Uzbekistan.

[39] Completion date may change given the situation in Afghanistan.

ANNEX 7: Climate Change and Natural Hazard Risks and Adaptation Opportunities

Climate context and vulnerability of Tajikistan and Central Asia

1. The Central Asian region is exposed to the negative impacts of a changing climate because of a harsh and unique context – an arid, landlocked, snow-fed region with most of the water originating in the glaciers of the upstream mountains and neighborhood countries, extensive agriculture, ageing infrastructure, and high population growth. The reservoir at Rogun HPP is located upstream of several riparian countries (Kazakhstan, Kyrgyz Republic, Turkmenistan, and Uzbekistan), and although riparian countries of the region have distinct landscapes, natural-climatic conditions, development priorities, the transboundary nature of climate change will affect each Central Asian nation with novel risks. With mountains covering 93 per cent of the country and vast natural water reserves, Tajikistan has significant hydropower potential. However, Tajikistan faces significant risks from flash floods, and notably glacier lake outburst floods (GLOFs), which occur when moraine dams holding back accumulated meltwater in high altitude areas are breached. These events can also happen because of, or cause, landslides, and dangerous mudflows.[40] In specific, this region also faces risks of the following: river flood (high risk), urban flooding (high risk), seismic and landslide activity (high risk), water scarcity (medium risk), and extreme heat (medium risk).[41]

Intent of the Project to address climate risks and vulnerabilities

2. Rogun HPP is central to Tajikistan's climate adaptation and water security strategies. It is integral to the National Strategy for Adaptation to Climate Change (NSACC 2030), which prioritizes modernizing water infrastructure in response to changing glacier and snowmelt patterns. Tajikistan's CCDR also outlines that completion of the Rogun HPP enhances climate change adaptation by improving water resource management and ensuring a reliable water supply through its multipurpose function. The importance of Rogun HPP to the country's energy access is explained in paragraph 22 in the main text.

3. Given that Central Asia's water management is highly complex due to the transboundary nature of many of the region's rivers, the reliable water storage and flow regulation provided by Rogun HPP can ensure a more predictable and equitable distribution of water, reducing climate change impacts on regional water scarcity and enhancing collaboration and benefits over shared resources. The Rogun HPP provides opportunity to mitigate adverse effects of climate change on downstream areas (Nurek HPP), as it is designed to attenuate extreme floods up to PMF and the water discharge structures (e.g., surface spillways and flood-discharge tunnels) are designed taking this into account, thus addressing the above identified risks of flash floods and GLOFs, but also enabling longer term resiliency in the basin and reservoir management.

4. Considering the importance of hydropower for the country's supply of electricity, and its plans to build new hydropower plants, it is also very important to consider the impact of climate change on hydropower availability. Achieving energy independence by 2030 is one of Tajikistan's priority policy objectives, as reflected in the country's NDC. The MEWR targets an increase in total generating capacity to 10 GW, as well as reduced network losses and greater power exports.

[40] GFDRR. (2017). Disaster Risk Profile: Tajikistan. https://www.gfdrr.org/sites/default/files/Tajikistan.pdf
[41] Think Hazard, Tajikistan, The World Bank (2021. https://www.thinkhazard.org

Project activities contributing to climate risks mitigation and increasing climate resilience

Component/Subcomponent	Activities and relevance to climate change risks	Amount financed by IDA (USD M)
	Component 1	
Electromechanical activities	The design of electromechanical equipment includes design specifications that account for projected increases in precipitation due to climate change, thereby minimizing the risk of damage or dam failure.	183
Right Bank structures	Rogun HPP is designed to attenuate extreme floods up to the PMF. The water discharge structures, including surface spillways and flood-discharge tunnels, are specifically designed to handle these extreme events. This design consideration ensures that the infrastructure can withstand significant hydrological events, thereby protecting it from potential climate-induced damages. Construction of dam spillways addresses climate change-exacerbated flood impacts and improve dam safety.	30
	Component 2	
Sub-component 2.1 Project Management Consultant	The PMC contract will support Rogun OJSC and PMG with the following: management of transition of PMC responsibilities from current Employers Representative (ER) to the new PMC, regular updates to the OIP, preparation and subsequent updating of construction supervision and quality assurance plan, preparation and subsequent upgrading of the instrumentation plan, preparation and subsequent upgrading of operations and maintenance plan and EPP, contract management, review of contractors' implementation programs, monitoring of contractors' compliance with the requirements of E&S instruments, site supervision and quality control, review and approval of payment certificates, and management services by providing core leadership positions to build the capacity of Rogun PMG. The PMC plays an important role in ensuring that the project is resilient to climate risks. Through the implementation of climate-resilient design solutions, advanced flood forecasting systems, optimized reservoir management, capacity building, compliance with environmental and social frameworks, and continuous monitoring and evaluation, the PMC will significantly contribute to the project's climate adaptation efforts.	92
Sub-component 2.3 Implementation support	Support the implementation of Project activities, including, inter alia: (i) retention of DSPOE and ESPOE; (ii) strengthening of technical, fiduciary, E&S, monitoring and evaluation and communications capacity, including Rogun OJSC's capacity to monitor BSP's implementation; (iii) strengthening corporate governance; (iv) Project	16

	audits and audits of the Project Implementing Entities' Financial Statements; (v) implementation of the Gender Action Plan (GAP) and grievance redress mechanism (GRM); (vi) carrying of technical and economic studies and advisory services that may be required during Project implementation and as may be agreed in writing with the Association; (vii) technical assistance to strengthen the capacity of Rogun OJSC to administer the PPAs; (viii) Environmental and Social Management Plan (ESMP) implementation costs; (ix) independent third-party monitoring of the implementation of the RAP and LRP; and (x) Operating Costs. This sub-component significantly contributes to climate adaptation by building capacity, developing climate-resilient guidelines, supporting risk management infrastructure, monitoring and evaluating adaptation measures, providing technical support for climate-risk management, and enhancing water governance. These efforts collectively ensure that the project is well-prepared to handle the impacts of climate change and remains resilient over the long term.	

Component 3		
Sub-component 3.1:	This sub-component will finance the costs related to relocation compensation and apprenticeship stipends under the RAP and LRP. Both the RAP and LRP are designed to be climate-informed, addressing climate adaptation through the following measures: 1. **Climate-Resilient Infrastructure**: Ensuring that replacement properties and infrastructure are built to withstand climate-related risks such as floods and extreme weather events. 2. **Sustainable Livelihoods**: Promoting sustainable livelihoods that are resilient to climate change impacts, such as training in climate-smart agriculture and renewable energy technologies. 3. **Environmental Safeguards**: Implementing environmental safeguards to protect natural resources and reduce the vulnerability of communities to climate change. These measures are part of a broader effort to integrate climate adaptation into the resettlement and livelihood restoration processes, ensuring that affected communities are better prepared to cope with the impacts of climate change. The environmental and social instruments of the Rogun HPP Project are updated to comply with the World Bank's Environmental and Social Framework (ESF). This includes the preparation of a community health and safety plan, emergency management plan, traffic management plan, and security management plan. These measures ensure that the project infrastructure is resilient to climate risks and that the health and safety of the surrounding communities are protected. The project includes the design of a community benefit-sharing program that contributes to equitable development and sustainable socio-economic growth at the local and national levels. This program ensures that the benefits of the project are shared with the affected communities, enhancing their resilience to climate change impacts.	24
Component 4		
Sub-component 4.1 Hydromet investments	The purchase and installation of hydro meteorological instrumentation and TA to build key monitoring capacity in the Vakhsh basin to support the operation of Rogun HPP and mitigate future climate risks, including: (i) small construction works for installation of the required equipment for in-situ stations; and (ii) development of an operational monitoring and forecasting system integrating in-situ observations with satellite monitoring of seasonal snow cover extent and other variables. ***These activities will support improved management of climate extremes and variable water availability.***	1.5
Sub-component 4.2	TA for improved water use: (i) development of the Reservoir Management Rules for the Main Reservoirs in the Vakhsh River basin,	2.5

	including the interim Reservoir Management Rules for the period of Rogun Reservoir construction, reservoir filling and operation; and (ii) building the capacity of the BWO Amudarya Tajikistan Branch, reporting to the MEWR and BWO Amudarya's headquarters, and carrying out tasks mandated by the ICWC for information management and water accounting. The project includes the preparation of optimized reservoir operating rules based on the flood forecasting system. An advanced flood forecasting software has been developed for Rogun HPP. This software utilizes data on snow cover, summer temperature forecasts, and precipitation to predict flood flows. The system is periodically refined and improved by comparing predicted flood flows with actual flood flows. This capability enhances the project's flood-handling capacity, ensuring timely responses to flood risks and minimizing potential damage to infrastructure. These rules are reviewed and updated for both Rogun and Nurek reservoirs to enhance their flood-handling capacity and ensure the safety and resilience of the infrastructure. ***These activities will lead to strengthened capacity to implement the basin management plan and optimize operations of the reservoir cascade in the context of climate change.***	
Sub-component 4.3	Monitoring water use: Purchase and installation of equipment, including sensors and telemetry equipment, for the modernization, including retrofitting, of selected hydroposts located in the Vakhsh River basin to support the continuous transmission of real-time water level data from the upgraded hydroposts to BWO Amudarya Tajikistan Branch and to the National Water Information System. ***The hydroposts contribute to improved regional water management in response to climate change.***	1