

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Report No.: PIDA30622

Project Name	Naghlu Hydropower Rehabilitation Project (P132944)
Region	SOUTH ASIA
Country	Afghanistan
Sector(s)	Hydropower (70%), General water, sanitation and flood protection sector (30%)
Theme(s)	Infrastructure services for private sector development (90%), Other environment and natural resources management (5%), Other social development (5%)
Lending Instrument	Investment Project Financing
Project ID	P132944
Borrower(s)	Islamic Republic of Afghanistan
Implementing Agency	Da Afghanistan Breshna Sherkat
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	02-Nov-2015
Date PID Approved/Disclosed	04-Nov-2015
Estimated Date of Appraisal Completion	30-Oct-2015
Estimated Date of First Grant Approval	25-Feb-2016
Appraisal Review Decision (from Decision Note)	The Chair authorized the Team to proceed to appraisal, subject to the following conditions: (i) Receive clearance from the Regional Safeguards Advisor; (ii) Expiration of the Riparian notification period, as required under OP 7.50; and (iii) Revision of the Project Appraisal Document (PAD) to reflect the guidance received from this meeting (re clarifying project description and issue of project phases). The above conditions were met on October 30, 2015.

I. Project Context
Country Context

1. Afghanistan continues to remain one of the least-developed countries in the world. The pace of economic recovery has been slow, with real gross domestic product (GDP) growth in 2015 estimated at 1.9 percent (from an average of 9 percent during 2003–12 and 3.7 percent in 2013), largely attributed to the long protracted process of political transition, a deteriorating security situation, and erosion in investor and consumer confidence. Domestic revenue declined considerably over the transition period, falling to about 8.2 percent of GDP in 2014, a level inadequate to finance the current level of spending (around 36 percent of GDP), particularly in the areas of security, service delivery, essential infrastructure, and operation and maintenance (O&M).

However, domestic revenue collection increased marginally in the first half of 2015 to about 12 percent (about US\$820 million), due to an increase in tariffs and tax compliance.

2. Lack of security is perceived as the most important constraint for public service delivery in Afghanistan. The country continues to confront a state of fragility and conflict that is undermining economic prospects as well as social cohesion and stability. Insecurity is affecting growth and poverty by damaging human capital, constraining productive economic activities, increasing social unrest, promoting unequal access to basic services, and increasing political instability. Socioeconomic indicators continue to remain at low levels: poverty incidence nationwide was 35.8 percent in 2011–12, compared to 36.3 percent in 2007–08. The bottom 40 percent of the population commands only 21 percent of total consumption, and more than 50 percent of the population risks descending into poverty.

3. International donors have committed to continue providing financial assistance to Afghanistan contingent on satisfactory reform progress. At the December 2014 London Conference, the international community reaffirmed its Tokyo commitment of providing US\$16 billion in developmental assistance for Afghanistan over 2012–15, sustaining support through 2017 at or near the levels of the past decade, and providing continuing but declining support through the ‘Transformation Decade’ (2015–24). These funds will allow Afghanistan to progress toward sustainability and development of its infrastructure targets. Contingent upon a relatively stable political and security environment, the medium-term economic growth outlook is projected at about 5 percent per year during 2016–18.

4. The government's development vision focuses on tackling corruption and building better governance, restoring fiscal sustainability, bolstering private sector confidence, promoting growth, and improving security and political stability. The government's development budget for 2015 has an allocation of about US\$2.675 billion to address the deficit in infrastructure needs such as roads, hydropower and irrigation dams, power networks, mines and the petroleum sector, airports, and urban development.

5. Infrastructure investments, and especially energy investments, play a critical role in contributing to economic growth and stabilization. Indeed, getting access to electricity is a major barrier to growth in Afghanistan, which ranks only 141 of 189 countries worldwide for access to electricity. As in any country, access to modern energy services, and especially to electricity, is a key factor for fostering economic growth and equitable development in Afghanistan. Better energy services will help meet the development goal objectives of the government of Afghanistan (GoA) by stimulating job growth and production and improving the quality of life for millions. The importance that the GoA accords energy is reflected in the fact that after the security sector, infrastructure has the second largest share in the government budget.

6. The energy sector in Afghanistan has suffered serious neglect, resulting from decades of devastating civil war and insurgency. Challenges mainly relate to the physical condition of equipment resulting from delays in O&M and inadequate institutional capacity. This has led to large parts of the electricity infrastructure either having been destroyed or having become dilapidated (for example, 65 percent of the transmission lines were destroyed) and has eroded the capacity of operations and investment management at Afghanistan's power utility Da Afghanistan Breshna Sherkat (DABS). However, unlike in other countries affected by similar warfare, the main infrastructure has remained in place.

7. Identifying opportunities for reliable and sustainable energy generation in Afghanistan is urgent: US fuel subsidies for electricity generation are expected to be phased out by the end of 2015, which is expected to adversely affect the financial viability of the country's power system, further damage the economy, and worsen the quality of life for many. On the other hand, cost recovery remains a pivotal issue for the financial sustainability of the sector.

Sectoral and institutional Context

Energy Sector Background

8. Access to electricity. In June 2015, Afghanistan's access to electricity rate was estimated at about 25–30 percent. Electricity is available mainly in the urban areas and along a few transmission corridors. At approximately 497 kWh per person per year, Afghanistan's electricity consumption compares unfavorably with the South Asia average of 667 kWh per person in 2012 and the average electricity usage of 3,100 kWh per person worldwide in 2012. Nevertheless, electricity access has significantly improved in recent years, increasing from a level of only about 6 percent in 2005. It is estimated that 91.6 percent of all customers are residential and 6.6 percent are commercial. Less than 10 percent of rural areas are connected to the grid.

9. Transmission system. The Afghan power system remains small, fragmented, and underdeveloped. The transmission system consists of four major working islands linking the different generation sources to the grids: (a) the North East Power System (NEPS), which consists of multiple small islands and connects 17 load centers including Kabul, Mazar-e-Sherif, and Jalalabad with Tajikistan and Uzbekistan (at 220 kV, 110 kV, and 35 kV); (b) the South East Power System consisting of Khandar and linking with Kajaki (110 kV); (c) the Herat System linking with the Islamic Republic of Iran and the Republic of Turkmenistan (132 kV and 110 kV); and (d) the Turkmenistan System linking Herat Faryab, JawzJan, Sar-e-Pul, and Andkhoy Districts (110 kV).

10. Energy mix. The Afghan energy system is closely integrated with some of its neighboring countries. Electricity imports (in GWh) make up 81 percent of electricity supplied to Afghans, as projected for 2015–16. Imported electricity largely comes from the Islamic Republic of Iran, Tajikistan, Turkmenistan, and Uzbekistan and delivers the equivalent of about 1,200 MW in capacity to Afghanistan. The regional interconnections have helped Afghanistan meet unserved demand at a low cost, increasing demand served from 1,289 GWh in 2006 to 3,086 GWh in 2011. This has contributed significantly to reducing the load shedding previously experienced in Kabul.

11. Hydropower provides 94.6 percent of domestically generated electricity with an installed capacity of 254 MW (and an absolute share of domestically installed capacity of 49 percent). In mid-2015 there were 12 hydropower plants in Afghanistan, not counting the over 5,000 off-grid micro hydropower plants constructed under the National Solidarity Program (NSP). The two largest among those are Naghlu Hydropower Plant at 94 MW installed capacity and Mahipar Hydropower Plant at 66 MW installed capacity. The power generation mix is run to minimize costs by favoring cheap power sources from abroad and the use of domestic hydropower over thermal and diesel power plants. The government plans to continue increasing import capacity through projects set out in the National Energy Supply Program (NESP).

12. Options for future domestic power generation. While there is significant potential for

domestic generation in the longer term, the options in the short term are limited. The only new domestic generation project in the last five years (the 105 MW diesel project at Tarakhil completed in 2010) has not been used to full capacity due to high operating cost and fuel shortages. Also under development, but much delayed, are 18 MW of additional capacity at the Kajaki Hydropower Plant in the south of the country (supplying the SEPS) and the 42 MW Selma Hydropower Plant in the west of the country (supplying the Herat system). Among the most feasible options in the short term for improving availability of low cost domestic generation sources is the rehabilitation of NHPP.

13. The 2013 Power Sector Master Plan prepared for Afghanistan's Ministry of Energy and Water (MEW) with financing from the Asian Development Bank (ADB) on the longer term options for power generation identified 15 potential hydropower plants ranging from 18.5 MW to 4,000 MW with a total potential capacity of 23,000 MW. However, further geological surveys, feasibility assessments, and other ancillary assessments are required to assess the prospects of these potential hydropower plants.

14. The development of the mining and gas sectors also offers opportunities for domestic generation. Natural gas is found in the north of Afghanistan; in the longer term, there is a possibility of domestic gas discoveries in commercial quantities being available for large-scale generation. The U.S. Geological Survey and the Afghan Ministry of Mines and Industry estimated 444 billion cubic meter of undiscovered, technically recoverable natural gas in addition to the identified reserves. All identified reserves and productive wells are located in the vicinity of Shebergan, where a gas field project is being developed and a 40 MW gas-fired power plant is planned by a private promoter with support by the International Finance Corporation (IFC). Blocks in two basins, namely the Amu Darya and the Afghan-Tajik—both multibillion-dollar foreign investments—have been tendered. The Amu Darya project started operations in 2012 but suspended oil production in 2013. In addition, three oil basins (Tripul and Kushka in the northwest and Katawaz in the southeast) could potentially be in the pipeline for tender over the next 3–5 years. The development of coal mines, though with some uncertainty, could provide fuel for a 400 MW coal-fired power plant at Ispushta linked to the copper mining concession at Aynak, of which about 100 MW would be available to the NEPS.

15. Energy institutions. The Ministry of Energy and Water (MEW) oversees the energy sector in Afghanistan. Up until 2009, Afghanistan's power utility was a department of the MEW under the name of Da Afghanistan Breshna Moassesa. Since the power utility was spun off, the MEW has been increasingly focused on policy, strategy, and planning issues. The MEW has taken the lead on the preparation of the NESP and the Power Sector Master Plan. The MEW is also leading the dialogue with Afghanistan's neighbors and donors. The power utility, which currently remains vertically integrated, was set up under the name of the DABS. The DABS has been able to establish itself as a financially independent and commercially viable entity while remaining under state ownership. Initially, the DABS was only responsible for the daily operation of the transmission and distribution system, but it is increasingly also carrying out its own investment program.

16. The DABS is incorporated and governed by an independent board, which is constituted by different government agencies, with the Ministry of Finance (MoF) holding 45 percent of the ownership of the DABS, the MEW holding 35 percent, and 10 percent each with the Ministry of Economy and Ministry of Urban Affairs. The DABS faces significant challenges, including overstaffing and under-qualification of staff; poor customer management, billing, and collection; and tariffs that do not fully recover costs. Support to strengthen its institutional, financial, and

human capacity is needed to improve the power system of the country.

17. The road ahead. The rehabilitation and improvement of the energy sector is a high priority for the GoA and a critical part of its national development program. Since 2001, the World Bank and Afghanistan Reconstruction Trust Fund (ARTF) implemented four projects and conducted multiple well-received sector development studies to improve power sector. This allowed for significant progress in addressing the physical as well as the institutional challenges of the sector. Moving forward there are three major obstacles that need to be addressed to improve Afghanistan's energy service delivery: (a) ensure implementation of its investment plans (NESP) in spite of a general deterioration in security over the last few years; (b) recover its full costs while ensuring that electricity is affordable for residential consumers and businesses; and (c) enhance sector knowledge to adequately inform investment decisions.

The Proposed New Naghlu Hydropower Rehabilitation Project

18. The NHPP is located on the confluence of the Panjshir and Kabul Rivers in the Surobi District, Kabul Province, about 80 km east of Kabul. Naghlu was first commissioned in 1967 and financed by the former Soviet Union. The equipment was manufactured by Technopromexport, a Russian engineering company founded in 1955. Its reservoir is dammed up by a concrete gravity wall. Due to the small reservoir capacity and high inflow, reservoir operation is limited, and the hydropower plant's operation is comparable with a run-of-river plant. The head is 61 m. The four Francis turbines of the plant have an overall rated capacity of 94 MW (23.5 MW each). In mid-2015, the NHPP is of strategic importance to Afghanistan's power generation portfolio as it provides more than half of Kabul's electricity.

19. By 2001, when political power changed, only two turbines remained operational. To remedy the situation the World Bank with the support of ARTF prepared an Emergency Power Rehabilitation Project (EPRP) in 2004 in the amount of US\$105 million. The EPRP financed the rehabilitation of three of the four turbines and the auxiliary plant as well as substantial rehabilitation of transmission and distribution networks in the Kabul area. The rehabilitation of unit 1 could, however, not be completed. O&M continued to be lacking, and as a result, some of the other units may also now require overhaul.

20. Improving and restoring the physical infrastructure of power systems in Afghanistan is a low-cost option for enhancing domestic electric capacity as long as the gains in restoring this infrastructure are sustained through improved O&M processes. However, the EPRP was unable to sufficiently change O&M practices at Naghlu, which has contributed significantly to the deficiencies that are to be addressed under the proposed project and as discussed below. While short-term restoration projects are critical for addressing current needs, promoting long-term sustainability of the power sector mandates an ongoing learning process that mainstreams best industrial practices into hydropower plant management.

21. Analysis undertaken in 2014/15 concluded that the dam safety management of the Naghlu is unsatisfactory and requires immediate attention. Issues include the following:

- Sediment management. The extent of sedimentation in the reservoir has never been measured. The DABS estimates that sediment has accumulated at a level of 7 m above the low-

level outlet, rendering it inoperable. This has serious ramifications on the hydrological safety and flood discharge.

- Potential presence of the unexploded ordnance (UXOS) in the reservoir complicates sediment management in the dam.
- There is a need for a dynamic stability analysis to determine structural safety under earthquake loading.
- Unavailability of auxiliary methods of operating spillway gates, independent operation of power intake gates, and lack of essential instrumentation render the dam unsafe.

22. Poor O&M at the plant does not allow for safe and sustainable plant operation. While training had been provided under EPRP, further capacity building and training support is therefore needed, not only for Naghlu but for the sector as a whole.

II. Proposed Development Objectives

The Project Development Objective (PDO) is to improve dam safety and to increase the supply of electricity at the Naghlu Hydropower Plant.

III. Project Description

Component Name

Component 1: Mechanical, Electrical, and Electromechanical Works

Comments (optional)

This component complements the rehabilitation of the electrical and electromechanical parts of the plant previously undertaken and ensures their sustainable operation. It consists of two subcomponents: (a) Rehabilitation of Unit 1 and Balance of Plant; and (b) Enhancing Maintenance of the Powerhouse.

Component Name

Component 2: Dam Safety and Power Generation Improvement

Comments (optional)

This component aims to ensure the safe operation of the dam through the two subcomponents: (a) Dam Safety Audit and Safety Improvement Measures; and (b) Optimization of Power Generation.

Component Name

Component 3: Environmental and Social Sustainability, Project Management Support, and Future Project Preparation

Comments (optional)

This component includes two subcomponents: (a) Environmental and Social Sustainability; and (b) Project Management Support and Future Project Preparation.

IV. Financing (in USD Million)

Total Project Cost:	83.00	Total Bank Financing:	0.00
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
Borrower			0.00
Afghanistan Reconstruction Trust Fund			83.00
Total			83.00

V. Implementation

A. Institutional and Implementation Arrangements

23. Overall responsibility for project implementation will rest with the DABS, whose chief executive officer (CEO) will delegate day-to-day management to heads of departments. Implementation will be grounded in the operation departments of the DABS. Oversight of technical and safeguards issues will rest with the chief operating officer (COO) and oversight of fiduciary issues will be with the chief financial officer (CFO) and Project Management Office (PMO).

24. To implement the project, the DABS has appointed a project manager for day-to-day project management. The project manager, who reports directly to the COO, has overall implementation responsibility for the project, coordinating project work within the DABS, reporting to the DABS management on progress and challenges, and cooperating with the Bank on the project.

25. Within the DABS, key project staff with adequate qualification and appropriate skills have been identified or hired. They include a civil works supervisor, an electromechanical and electrical supervisor, a knowledge and learning specialist, an FM specialist, a procurement specialist, an environmental specialist, a social specialist, and an M&E specialist.

26. All project staff will be sitting within their respective departments in the DABS to ensure close and continued integration in the organization. An international procurement specialist and technical and safeguards consultants have been hired for specific assignments to support and mentor concerned DABS staff. Capacity building for DABS staff started under the project preparation grant and will continue during implementation. MEW staff will also be eligible for training under the proposed project.

27. Independent advisors, the PTAP and ESAP, have been recruited to support the DABS in project implementation. The PTAP and ESAP will have an important role to play beyond the formal functions required under safeguard policies. The ESAP will participate in the independent grievance process while the PTAP will be involved mainly in the dam safety review. A PSC will provide the forum for overall guidance, policy advice, coordination of the project activities, and addressing of interagency issues as well as the security situation. The PSC will be chaired by the deputy minister of finance and will include deputy ministers for energy and water from the MEW and will have representatives from the agriculture and environment ministries, the president's office, and the Afghanistan National Security Forces. The PSC will oversee the project and provide policy-level guidance and interagency coordination for the project. The COO of the DABS will act as the secretary of the PSC.

B. Results Monitoring and Evaluation

28. Monitoring of project implementation progress, as well as progress toward the achievement of project objectives and results indicators will mainly be the responsibility of the DABS. To carry out the task, an M&E specialist has been appointed within the DABS to be supported and mentored by an international consultant. They will develop a monitoring framework and system in accordance with the DABS systems, collect data, establish baselines for indicators, and manage the M&E aspects of the project.

C. Sustainability

29. Four areas of this project are particularly important for its long-term sustainability, as given below:

(a) Ensuring that the NHPP is operating efficiently and in a stable manner.

(b) Ensuring that dam safety requirements are in accordance with international standards. Not only does this contribute to the plant's sustainability, but it will also set the standard for both existing and future dams in Afghanistan.

(c) Strong ownership is required to ensure sustainability of project results. The DABS has demonstrated its commitment and ownership of the project as evidenced by its proactive response during the preparation of the project.

(d) The project will set in place O&M, emergency preparedness plans, and training programs for the plant staff. These are expected to contribute to the overall sustainability of the NHPP.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04	x	
Forests OP/BP 4.36		x
Pest Management OP 4.09		x
Physical Cultural Resources OP/BP 4.11	x	
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37	x	
Projects on International Waterways OP/BP 7.50	x	
Projects in Disputed Areas OP/BP 7.60		x

Comments (optional)

VII. Contact point

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