

Afghanistan Reconstruction Trust Fund Proposal

Afghanistan Power System Development Project (January 2011)

Applicant:	Islamic Republic of Afghanistan (IRoA)
Brief Description:	<p>Islamic Republic of Afghanistan has requested ARTF funds for supporting the following power system development investments:</p> <ul style="list-style-type: none"> i) Rehabilitate and augment the medium and low voltage distribution networks in Pul-e-Khumri, Charikar, Gulbahar, Jabul-Seraj towns, located on North East Power System (Aybak, Doshi and Khenjan towns originally planned for phase II of this project, have now been dropped as Government of Afghanistan has requested KFW for funding these distribution networks). ii) Rehabilitation of transmission switchyards associated with Naghlu and Mahipar hydropower projects, for reliable transmission of power generated from these plants to Grid. iii) Institutional capacity building of executing agencies; project management support; establishment of a unit for promotion of Energy Efficiency and Demand Side Management; implementing some pilots; and collection of baseline energy usage information for the urban centers under the project. <p>Following a programmatic approach to rehabilitating and expanding the Afghanistan power system, this Project builds and complements the investments made under the ARTF funded Kabul-Aybak-Mazar-e-Sharif Power Project approved in October 2007 (TF 091120) and the IDA Emergency Power Rehabilitation Project (EPRP) approved in June 2004.</p>
Project Development Objective:	The Development Objective of the Project is to support : Increasing access to grid power and the quantity of available power to the consumers in the target areas of the urban centers at Pul-e-Khumri, Charikar, Gulbahar and Jabul-Seraj.
Performance Indicators	<ul style="list-style-type: none"> a) Increase in electricity access rate in Pul-e-Khumri, Charikar, Gulbahar and Jabul-Seraj (% of households). b) Increase in power supply quantity to project areas in Pul-e-Khumri; Charikar, Gulbahar and Jabul-Seraj (in MWh). c) Initiation of the energy efficiency promotion activities in Afghanistan.
Sector:	Infrastructure and Natural Resources, Power Sector

Location:	Baghlan (Pul-e-Khumri), Parwan (Charikar, Gulbahar and Jabul-Seraj) and Kabul (Hydro Power Generating stations) provinces
Total Project Cost:	The estimated funding requirement of the project is \$61 million (\$60 million from ARTF and \$1 million co-financing from IDA funded EPRP). \$35 million for phase I was approved by ARTF MC and released in 2009; release of \$25 million for Phase II is now requested.-
Amount Requested for ARTF MC Approval	<p>The proposal is to seek ARTF MC approval for \$25 million of Phase II funding for the project. -</p> <p>The Phase-I funding of \$ 35 million was allocated to cover Pul-e-Khumri, Charikar, Gulbahar & Jabul-Seraj distribution networks; establishing Energy Efficiency Cell at MEW; and corresponding Project Management support.</p> <p>The balance activities, preparation for some of which is under way, are to be covered when the balance \$25.00 million are made available. These balance activities will mainly cover the switchyards associated with Naghlu and Mahipar hydropower plants and continuation of institutional capacity building and project management support. The details of these phases are available in the proposal.</p>
Implementing Agency	Ministry of Energy and Water (MEW)
Implementing Period:	The current Project Closing Date is July 31, 2012. It is proposed to extend the Project Closing Date by one year, i.e., up to July 31, 2013, to cover the completion of the Naghlu and Mahipar Switchyards and the delays that have occurred in the past.
Implementation Arrangements	The implementation arrangements under EPRP were followed for Phase I and will continue to be used for Phase II.
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Reviewed and Cleared by the Administrator	Loan Department; Legal Department; Country Management and Sector Management Units

Table of Contents

- I. **PROPOSAL SUMMARY**

- II. **PROJECT DESCRIPTION**
 - i. Project Development Objective
 - ii. Project Components
 - iii. Project Cost by Components

- III. **IMPLEMENTATION PROGRESS**

- IV. **RECOMMENDATION**

I. ...PROPOSAL SUMMARY

1. The funding proposal submitted to the ARTF Management Committee in 2008 requested ARTF funding support in the amount of US\$ 60 million for the Power System Development Project (APSDP). Due to limited funding available at that time, it was decided at the outset to divide project implementation into two phases. Phase I of the Project is currently ongoing with funding of \$35 million. Priority works were commenced under Phase I. The commitments to date are \$24.04 million and the disbursements stand at \$7.71 million. Overall Implementation Progress to date has been Moderately Satisfactory. The Government of Afghanistan has requested the Management Committee of the ARTF to release the funding allocated for Phase II (MOF letter dated February 21, 2010 attached). The Ministry of Energy and Water has already prepared and issued the bidding documents for the rehabilitation of switchyards associated with Naghlu and Mahipar hydropower plants to be funded under Phase II of APSDP.

II. PROJECT DESCRIPTION

A. Project Development Objective

2. The Development Objective of the Project is to support the Recipient in increasing access to grid power and the quantity of available power to the consumers in the target areas of the urban centers at Pul-e-Khumri, Charikar, Gulbahar, and Jabul-Seraj. This will be achieved through: (i) provision of grid connectivity to Charikar, Gulbahar, and Jabul-Seraj consumers, currently receiving power supply for a few hours a day through off-grid diesel/hydro generators; (ii) rehabilitation of the transmission switchyards associated with the largest two hydro power plants in Afghanistan- Naghlu and Mahipar; and (iii) augmentation of Pul-e-Khumri medium and low voltage distribution network to cover more areas. The priority areas in each town are agreed with DABS and MEW, based on the critical needs of the distribution system assessed by the consultants (M/s SMEC, Australia). Phase II of the project originally included distribution networks in Aybak, Doshi and Khenjan towns, but these have been dropped from the scope of this project as KFW has agreed with IRoA to fund those networks.

3. The Project is also supporting the setting up of a cell in MEW to promote energy efficiency and demand side management and implement some pilots. It is also: (i) supporting the capacity building of the distribution utility (DABS) for planning, operation and maintenance of the distribution network, by hands-on, on-site training; (ii) collecting baseline energy usage information for building an understanding of the attitude of consumers for the reforms needed in the sector; and (iii) providing support to DABS for implementation of measures to improve the accountability of energy flows (through system and end-user metering) to facilitate the

implementation of commercial improvement measures planned as part of the ongoing support for commercialization of the distribution operations of DABS. MEW has also requested that the support for capacity building of the Planning Cell, which is currently funded under EPRP, be continued under APSDP.

4. For outcome measurement, the following key indicators have been identified:

- a. Increase in electricity access in Pul-e-Khumri, Charikar, Gulbahar and Jabul-Seraj (% of households).
- b. Increase in power supply to project areas in Pul-e-Khumri; Charikar, Gulbahar; and Jabul-Seraj (in MWh).
- c. Initiation of the energy efficiency promotion activities in Afghanistan.

5. The baseline for these indicators and adequate monitoring arrangement to measure these indicators have been agreed and developed during project implementation. Although implementation progress on various project activities (Section III below) is being monitored, the progress against indicators is still to be monitored. The team has requested the MEW and DABS to start collecting field data which will enable the monitoring of these indicators on a regular basis.

B. Project Components

6. **The Project** has the following main components:

(i) Distribution System Rehabilitation (Phase I): This component supports investments for building new medium and low voltage system and installation of missing parts of the low and medium voltage distribution system in areas where network already exists. The main scope of work includes supply and installation of distribution transformers, underground cables, overhead line materials, aerial bunched cables, protection and distribution equipment, meters and associated equipment, etc. The existing systems in the target areas are being brought to the standard voltage system of 20 kV and also being reorganized to optimize loading to reduce losses and provide satisfactory power supply voltage to the customers. The urban centers covered are those located on the North East Power System - Pul-e-Khumri, Charikar, Gulbahar, and Jabul-Seraj. Additional meters for \$2.0 million will also be procured.

(ii) Rehabilitation of Transmission Switchyard Associated with Naghlu and Mahipar Hydropower Stations (Phase II): This component supports the rehabilitation of old and dilapidated switchyards located at Naghlu and Mahipar, which serve these major hydropower projects providing power to Kabul. These hydropower stations, which cover almost 75% of the total installed hydropower capacity in Afghanistan and are the most economical source of generation, feed Kabul and would also be connected to NEPS system. Investments are already committed for rehabilitation of hydropower projects (part of the work for Mahipar and Saroubi plants rehabilitation has been completed). The Naghlu generating plant rehabilitation

work is in progress under EPRP. The transmission line between Naghlu and Kabul has been rehabilitated under IDA/ARTF/KFW and EC funded projects. The switchyards would have been the only missing link in establishing the reliable hydropower plants operation and transmission of power to the grid. The switchyards being more than 30 years old have lived their lives, and have been partially damaged due to armed fighting during conflict. The Bidding Document for the switchyards has been issued, and the contract will be awarded upon availability of ARTF funds for Phase II.

(iii) Institutional Capacity Building, Project Management Support and Establishing an Energy Efficiency Cell at MEW (Phase I and II): This component covers support for:

- a. Establishment of a Cell within MEW to promote energy efficiency and demand side measures, including implementation of some pilots, preparing and implementing a communication strategy for awareness among consumers;
- b. Training in operation and maintenance of the distribution/transmission system through hands on training;
- c. Baseline studies and communication with stakeholders;
- d. Project management and implementation support for these investments and other related activities.

Training is being provided to DABS personnel on site by suppliers/contractors and specialized trainers on regular operation and maintenance of facilities, and detection and repair of faults to ensure reliable and quality power supply to the consumers.

C. Project Costs by Components:

	Phase-I USD million*	Phase-II USD million*	Total USD million*
Component A - Distribution System Rehabilitation	22.4	0	22.4
Component B - Rehabilitation of Transmission Switchyards associated with Naghlu and Mahipar hydropower stations	0	19.0	19.0
Component C – Institutional Capacity Building, Project Management Support and Establishing an Energy Efficiency Cell at MEW	1.7	2.0	3.7
Consumer Survey	0.1	0	0.1
Energy Efficiency Cell	3.5	0	3.5
Provision for Meter Boxes and Meters	2.0	0	2.0
Physical Contingencies**	3.0	2.1	5.1

Price Contingencies***	2.3	1.9	4.2
Total Cost	35.0	25.0	60.0
Requested ARTF Financing	35.0	25.0	60.0
Co financing from IDA credit (Cr. 3933-AF)	1.0	0	1.0
Total Funding	36.0	25.0	61.0

* Taxes are included in the respective component cost.

** A physical contingency of 8.5% is provided to cover the increased costs due to: increase in the geographic area and number of consumers to be served, rerouting of MV lines due to geographical/terrain difficulties; encroachment on 20kV line corridors for supplies to the cement plant in Pul-i-Khumri; and a difficult river crossing (301m) at Charikar. Other unforeseen factors will also be covered under this.

*** The price contingency of 7% will cover claims for price variation as a result of delays in LC operability, which delayed confirmation of equipment orders.

III. IMPLEMENTATION PROGRESS

7. Key achievements to date under the project include:

Institutional: The state owned utility DABM was corporatized into a corporate utility DABS on May 4, 2008 and took over the assets of DABM on September 30, 2009.

Distribution Works: Contracts for distribution works at Pul-e-Khumri (MEW/S-506- with Angelique) and Charikar, Gulbahar and Jabul-Seraj (MEW/S-504 – with ATSL/AEPC joint venture) were signed in March 2009. The rehabilitation and extension work included 173 km of MV lines, 10 km of underground MV cables, 420 km of LV lines and 170 distribution transformers. The contractors have completed survey and design work on rehabilitation of distribution networks for all the areas. The progress on distribution system rehabilitation is delayed by about one year, due to delays in release of funds, customs clearance issues, and pole quality issues. The pole design and quality issues have been resolved and pole manufacturing has begun, and installation work has commenced at project sites. Most of the equipment has been procured and is either being manufactured or has already arrived in Afghanistan. The delays also occurred due to delays in issuance of Letters of Credit and Letters of Special Commitment. The long delay in start of work on the 220kV Charikar substation, to be funded by the Government of India, is a major issue which would lead to stalling power distribution in Charikar, Gulbahar, and Jabul-Seraj areas. The Government of India has now informed that the contract award is at final stages.

Project Management: Services of SMEC International have been engaged by MEW as the supervision consultants for the Project; MEW signed contract with SMEC on June 1, 2010.

Electricity Needs Survey: The household energy survey has been completed. Results show that respondents are willing to pay more for better quality electricity, and there is awareness of energy saving and alternate energy measures. Results of study were disseminated in a workshop on October 6, 2010, which was chaired by the Minister of Energy & Water and attended by Ministry officials.

Energy Efficiency: The project aims to strengthen Afghanistan's capabilities to incorporate energy efficiency into its core energy development strategy and mitigate the impacts of high generation costs on consumers. The support includes: establishment of a Cell within MEW to work in the area of promoting energy efficiency and demand side measures, including implementation of some pilots; and preparing and implementing a communication strategy for awareness among consumers. The Energy Efficiency (EE) Cell has been established at MEW. An outline work plan for the EE Cell has been prepared. ARTF funded staff are working in the EE Cell closely with USAID consultants. The Bank is working closely with MEW for a well planned staffing of the Energy Efficiency Cell so that measures to support Energy Efficiency work can be effectively undertaken.

Two other activities in the energy efficiency area explicitly designed to promote energy efficiency and demand side measures in Afghanistan, are:

- a) Energy efficiency study for large public buildings in Afghanistan (funded by ESMAP); and
- b) Energy Assessment (Analytic and Advisory Activities, AAA) - Identification of energy efficient lighting solutions in Afghanistan

Both these Bank-executed studies have been completed and details of these activities have been shared with MEW and Inter-ministerial Commission on Energy.

The commitments and balance funds available under phase I at this stage are shown in the table below:

Item	USD
Current funding from TF-93513	35,000,000
Project (MEW/S-504) – Rehabilitation of Distribution System at Gulbahar, Charikar and Jabul-Seraj	15,196,182
Project (MEW/S-506) – Rehabilitation of Distribution System at Pul-i-Khumri	7,148,634
Project (MEW/S-510) - Consumer Survey	48,616
Energy Efficiency Cell (Engineers)	5,400
MEW/S-511, Project Management	1,644,504
Sub-total: Commitments	24,043,336
Physical and Price Contingencies	5,300,000
Total (Commitments + Contingencies)	29,343,336
Balanced Funds To Be Committed	5,656,664

Summary of TF-93513 Contractual Commitments

8. Issues: The project has faced several issues leading to significant delays in implementation. Delays in release of funds by the Ministry of Finance (MOF); issues with quality of poles being manufactured and used in distribution networks; delays in customs clearances of imported project equipment, were some the main issues. Although these issues have now been resolved after repeated interventions by MEW and the Bank, some of these issues will be closely monitored so that they do not re-surface.

IV: RECOMMENDATION

9. The Bank recommends that the ARTF Management Committee endorse its previous approval of the \$60 million operation by authorizing release of the remaining \$25 million. The single largest contract under Project Phase II is rehabilitation of transmission switchyards associated with Naghlu and Mahipar hydropower plants with a budget estimate of US\$19 million. Bids for this contract have been invited, and release of ARTF funding support of US\$ 25 million is urgent and critical to enable contract award.