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ENERGY POLICY PROJECT-II ANNUAL REPORT

MARCH 2012 – SEPTEMBER 2012

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CONTENTS

EXECUTIVE SUMMARY	1
Component 1: Monitoring and support of Project Implementation.....	2
Component 2: Advice and Support of Energy Sector Policy Reform	3
Component 3: New Projects, Planning and Development.....	4
BACKGROUND	5
COMPONENT 1: MONITORING AND SUPPORT OF PROJECT IMPLEMENTATION	7
Hydropower Plants.....	8
Thermal Power Plants	12
Degree to which Targets Were Met and Results Achieved	25
COMPONENT TWO: POLICY REFORM.....	27
Support to the Ministry Of Water And Power	27
Support to the Ministry of Finance	30
Support to the National Transmission and Dispatch Company (NTDC) & National Power Control Center (NPCC).....	31
Support to Ministry of Petroleum and Natural Resources	32
Support to the Energy Wing of the Planning Commission.....	33
Capacity Building	34
Degree to which Targets Were Met and Results Achieved	35
COMPONENT THREE: NEW PROJECTS	37
Mangla	38
Kurram Tangi.....	39
Additional Proposed Projects.....	40
Coordination & General Support Services to USAID	40
Degree to which Targets Were Met and Results Achieved	41
ANNEX A: PROJECT FINANCIAL SUMMARY	43

TABLES

TABLE 1.1: FINANCIAL DISBURSEMENTS FOR SIX SIGNATURE PROJECTS	7
TABLE 1.2: CAPACITY IMPROVEMENTS AT THE TARBELA HYDROPOWER STATION	8
TABLE 1.3: STATUS OF TARBELA REHABILITATION PROJECT- SEPTEMBER 2012	9
TABLE 1.4: STATUS OF GOMAL ZAM MULTIPURPOSE DAM PROJECT- SEPTEMBER 2012.....	11
TABLE 1.5: CAPACITY IMPROVEMENTS AT THE THERMAL POWER PLANTS	12
TABLE 1.6: STATUS OF THE MUZAFFARGARH THERMAL POWERE STATION PROJECT-SEPTEMBER 2012	14
TABLE 1.7: STATUS OF THE JAMESHORO THERMAL POWER STATION REHABILITATION PROJECT-SEPTEMBER 2012	20

ACRONYMS

ADB	Asian Development Bank
AEAI	Advanced Engineering Associates International
AEDB	Alternate Energy Development Board
CAR	Central Asia Region
CASA 1000	Central Asia South Asia 1,000-MW Power Import Project
CCGT	Combined Cycle Gas Turbine
CCP	Combined Cycle Plant
Circular Debt	In Pakistan power industry, money the GENCO owes to fuel suppliers that the DISCO is unable to recover from customers or subsidies
CMMS	Computerized Maintenance Management System
CPGCL	Central Power Generation Company, Ltd
CPPA	Central Power Purchasing Agency
DISCO	Distribution Company
E&D	Exploration and development
ECC	Economic Coordination Committee
EMMP	Environmental Monitoring and Mitigation Plan
EPP	Energy Policy Project
FARA	Fixed Amount Reimbursable Agreement
FESCO	Faisalabad Electric Supply Company
GE	General Electric
GENCO	Generation Company
GOP	Government of Pakistan
GTPS	Guddu Thermal Power Station
GZDP	Gomal Zam Dam Project
HSFO	High Sulfur Fuel Oil
IESCO	Islamabad Electricity Supply Company
IPP	Independent Power Producer
JTPS	Jamshoro Thermal Power Station

KESC	Karachi Electricity Supply Company
LESCO	Lahore Electricity Supply Company
LNG	Liquefied Natural Gas
MAF	Million acre feet
MOF	Ministry of Finance
MPNR	Ministry of Petroleum and Natural Resources
MTPS	Muzaffargarh Thermal Power Station
MWP	Ministry of Water and Power
MW	Megawatt, unit of electrical power, 1 million watts,
NEPRA	National Electric Power Regulatory Authority
NPCC	National Power Control Center
NTDC	National Transmission and Despatch Company
PC	Planning Commission
PDP	Power Distribution Program
PEPCO	Pakistan Electric Power Company
PSRP	Power Sector Reform Program
SOP	Standard Operating Procedure
T&D	Transmission and Distribution
TOR	Terms of Reference
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority

EXECUTIVE SUMMARY

This Annual Report is a deliverable of USAID'S Energy Policy Project-II, under USAID contract AID-EPP-I-00-03-0004-00; Task Order No. AID-391-TO-12-0002. This report provides a comprehensive record of the project's activities and achievements for the period March 2012 through September 2012; and also provides recommendations for future activities to achieve USG's overall objectives for the Pakistan power sector.

The Energy Policy Project (EPP) is a multiyear USAID-funded initiative designed to: (1) increase power generation, decrease losses and increase cost recovery in Pakistan's power sector by investing in selected energy infrastructure; and (2) facilitate GOP energy sector reform efforts through technical assistance provided to energy sector entities and the application of new technology.

EPP is designed to support the joint goals of the U.S. Government (USG) and the GOP for Pakistan's energy sector. The general framework for EPP activities is guided by several documents, including: USG Energy Strategy for Pakistan, the GOP's Power Sector Reform Program (PSRP), and the Integrated Energy Sector Recovery Report and Plan of the Friends of a Democratic Pakistan. Activities undertaken by EPP are mostly demand driven with input from USAID and the GOP implementing partners. The USG Energy Strategy for Pakistan called for "Signature Projects," i.e., large, highly visible power generating projects and power plant rehabilitation programs that would make significant additions to power supply.

Advanced Engineering Associates Inc. (AEAI) began implementation of EPP in 2008, with a focus on strengthening the GOP's institutional framework for the energy sector. In 2009, EPP's mandate expanded to provide assistance to USAID in financing and accelerating the completion of specific projects to help overcome power shortages and to strengthen the power sector through structural reforms and improved corporate governance.

Phase I of the Energy Policy Project was completed in Feb 2012. EPP Phase-II began in March 2012. EPP Phase-II, in accordance with USAID and GOP guidance, is structured into three interrelated sets of program activities. These include:

- Monitor and support Pakistani counterpart management in the implementation of approved and funded Signature Energy Projects and activities.
- Support policy reform and provide advice and support to the Ministry of Water and Power (MWP), Ministry of Petroleum and Natural Resources (MPNR), Ministry of Finance (MOF) and Planning Commission (PC) in the implementation of the Power Sector Reform Program.
- Conduct due diligence for new projects being considered for USG support.

Achievements under each of these three components are provided below.

COMPONENT 1: MONITORING AND SUPPORT OF PROJECT IMPLEMENTATION

Under this Component, EPP is providing monitoring and implementation support for six signature power generation projects, announced by Secretary of State, Hillary Clinton, which are designed to add MW to Pakistan's power sector and reduce unplanned outages. These projects include:

- Repair and rehabilitation of four power plant projects (three thermal power plants: Muzaffargarh, Guddu and Jamshoro and one hydropower plant, Tarbela with a total funding of \$68 million).
- Completion of two multipurpose dam projects (Gomal Zam and Satpara Dams, with a total funding of \$66 million).

When completed, these projects will add more than 863MW to Pakistan's generation capacity. As of September 2012, a total of 439MW have been added to Pakistan's electricity grid. Out of the obligated funding of \$134.121 million, a total amount of US\$**89,372,633** has been disbursed to GOP implementing partners as of September 2012.

EPP results, as measured by the amount of funds expended and megawatts of power gained, have exceeded projected results. The funds provided by USAID have resulted in more megawatts gained than originally planned, at the cost levels originally budgeted.

The USAD-funded signature projects cost about \$0.15 million per MW for the enhanced capacity, while new thermal generation in Pakistan costs about \$1.4 million per MW. Thus, the signature projects are delivering new generating capacity to the Pakistan power sector at 1/10th the cost of building new power plants.

The addition of 863MW to Pakistan's generation capacity is enough power to supply about 1.1 million homes, benefiting about 7 million individuals. The hydropower projects also provide benefits through the development of water storage capacity that can irrigate 206,500 acres of agricultural land.

The results as of September 30, 2012 from these USAID-funded activities are summarized in Table ES-1 below.

TABLE ES-1: EPP SIGNATURE PROJECTS: RESULTS AS OF SEPTEMBER 30, 2012

Project	Planned MW Gains per FARA	Expected Gains	MW added (as of 30 Sept 2012)
Muzaffargarh	165	475	280
Jamshoro	95	150	25
Guddu	55	75	-
Tarbela	80	128	128
Gomal Zam	17.4	17.4	-
Satpara	17.66	17.66	6
Total	430.06	863.06	439

COMPONENT 2: ADVICE AND SUPPORT OF ENERGY SECTOR POLICY REFORM

Under Component 2 of EPP, AEAI provides support and technical assistance for generation and transmission related studies and policy reform activities assigned by USAID. The activities undertaken focus on addressing and alleviating the policy issues highlighted in the USAID priority policy matrix: Mounting circular debt; insufficient supply of affordable electricity; inefficient power sector operations and excessive sector energy losses; poor governance and management of public energy sector entities, and excessive peak demand in summer. Completed activities include: (1) developing GENCO and NTDC business plans; (2) assisting the development of policies and procedures for the National Power Control Center (NPCC); and (3) providing technical expertise to the Ministry of Petroleum and Natural Resources (MPNR) on oil and natural gas sector issues. In addition under Component 2 AEAI provides advisory services to the public sector enterprises (PSEs) of the Ministry of Water and Power (MWP), Planning Commission (Energy Wing), and the Ministry of Finance (MOF). Through these activities EPP has developed strong partnerships with the Water and Power Development Authority (WAPDA) and with the public sector generation companies (GENCOs).

Specific activities completed under this component of EPP include:

- Institutional strengthening and organizational development of energy sector entities by conducting pre-rehabilitation audits of three public sector generation companies (GENCOs), and by preparing Business Plans for GENCOs and NTDC (National Transmission and Dispatch Company).
- Capacity building and training of power sector entities on economic dispatch, improved operational and maintenance techniques for hydro and thermal power stations.
- Analysis of the economic value of natural gas in various sectors for facilitating policy decisions on allocation and pricing by the PC and MPNR.
- Analysis of the economic and environmental benefits of importing LNG and provided assistance in developing an LNG policy for the MOF.
- Review of options for development of shale gas and for support to exploration and development (E&D) programs and development of a downstream oil and gas policy.
- Provide technical assistance and advice and institutional strengthening to support development of energy efficiency and energy conservation resources in Pakistan.
- Development of a report on the causes and impacts of power sector circular debt, including recommendations to reduce the current amount and prevent its recurrence.
- Analysis of NPCC's economic dispatch capabilities, including recommendations to develop and implement new modeling technology that will improve system dispatch, reduce losses and increase power delivery to end users.
- Explore options for importing electric power into Pakistan from the CAR Countries through Afghanistan.

COMPONENT 3: NEW PROJECTS, PLANNING AND DEVELOPMENT

Under Component 3 of the EPP, AEAI conducts due diligence on new projects being considered for USG support, such as Kurram Tangi, Warsak, and the Mangla Dam, and prepares reports submitted to USAID in order to provide detailed information on the projects, reduce USG risks, and establish a basis for creating Project Implementation Agreements for selected projects. EPP also identifies projects that would further the USG's and GOP's joint goals for the Pakistan energy sector, while complementing current EPP activities, and vets these proposed projects with USAID and the GOP implementing partners.

EPP will continue to build upon its previous accomplishments and provide support to GOP energy entities in the following areas:

- Monitor and support Pakistani counterpart management in the implementation of ongoing six Signature Energy Projects to increase the generation capacity.
- Undertake due diligence for potential new rehabilitation projects and make recommendations to USAID.
- Provide assistance in the adoption and implementation of Business Plans by the GENCOs and NTDC to make them commercially viable public sector entities by improving their efficiency, capacity and availability of megawatts.
- Institutional strengthening and capacity building of Pakistan's power system operator (National Power Control Center) for reliable and efficient system operation.
- Technical support to MPNR on shale gas policy and LNG import in order to meet demand in the industrial and power sector for sustained economic growth.
- Recommendations to the GOP and MWP on the import of power from the Central Asian Republics.
- Analysis of issues of the power sector including circular debt and tariff subsidy for MOF.
- Provide advice and support to MOF to devise plans and strategies to address the financial aspects of the power crisis.

BACKGROUND

When EPP was initiated in 2008, Pakistan was in the midst of an unprecedented energy crisis. Power supply had not increased fast enough to meet demand growth causing widespread power outages and limiting economic growth and employment. This situation was precipitated by many factors, including: poor power sector planning and governance; lack of targeted, and payment of, subsidies; failure to address power theft; insufficient revenue to conduct needed maintenance at the GENCOs and NTC; and the lack of a coherent policy to exploit indigenous energy (hydrocarbon, renewable, efficiency) resources.

USAID's Energy Policy Project (EPP) is designed to address Pakistan's chronic and severe electricity shortage, which has created a political and social crisis and threatened overall economic stability. Routine power interruptions of as much as 8-12 hours per day have resulted in social instability and reduced economic growth. During 2012, estimated power shortage ranged between 8,000 megawatts in the summer and 4,000 megawatts in the winter. Energy supply continues to lag behind energy demand, resulting in a significant portion of the population being deprived of electricity service. This limited access to electricity, combined with widespread shortages, has contributed to high poverty levels, and constrained economic growth and employment.

The challenge confronting USAID and the GOP was to design a quick impact program to promptly bring more power to the system while also addressing power sector reform issues so that the gains achieved would be sustainable in the long-term. EPP was designed to achieve these goals through a program of interrelated activities and interventions built around three major components:

- Monitor and support Pakistani counterpart management in the implementation of approved and funded Signature Energy Projects and activities.
- Support policy reform and provide advice and support to the Ministry of Water and Power (MWP), Ministry of Petroleum and Natural Resources (MPNR), Ministry of Finance (MOF) and Planning Commission (PC) in the implementation of the Power Sector Reform Program.
- Conduct due diligence for new projects being considered for USG support.

EPP achievements under each of these three components as compared with the EPP Work Plan are provided in the following sections of this Annual Report. Recommendations for future activities under EPP to achieve overall USG objectives also are provided.

COMPONENT 1: MONITORING AND SUPPORT OF PROJECT IMPLEMENTATION

EPP is providing monitoring and implementation support for the six signature power generation projects announced by the Secretary of State Hillary Clinton. These projects include rehabilitation of three thermal power plants (Muzaffargarh, Guddu and Jamshoro), and one hydropower plant (Tarbela Dam); and completion of two new multipurpose dams (Gomal Zam Dam and Satpara Dam). USG funding for these

These projects are being supported under Fixed Amount Reimbursable Agreements (FARAs). USG funding projects totals \$136.731 million (per revised agreements) and the estimated gains in generation are 863MW. As of September 30, 2012, the total amount disbursed to the GOP implementing partners was \$89.37 million.

To complete these projects, EPP is working closely with GOP implementing partners, the GENCOs and WAPDA, to support implementation of a broad range of activities, which include:

- Dedicated technical experts assigned to thermal and hydro projects (Jamshoro, Guddu, Muzaffargarh, Tarbela, Satpara and Gomal Zam).
- Regular monitoring visits to project sites to verify deliverables/milestones, check quality of procured equipment, and verify completed construction work.
- Verify megawatts added through rehabilitation or new construction.
- Support implementing partners in designing work schedules, adherence & compliance with agreement terms & conditions, opening of accounts, reimbursement of invoices, ensuring environmental compliance with EMMPs, and resolution of issues during implementation.
- Certify compliance with construction specifications and/or technical standards of equipment.
- Compile monitoring and tracking reports to verify financial disbursements and technical progress.

Information on financial reimbursements made during the reporting period (March—September 2012) for the Six Signature Projects and total disbursements for the projects as of September 30, 2012, is provided in **Table 1.1** below.

TABLE 1.1: FINANCIAL DISBURSEMENTS FOR SIX SIGNATURE PROJECTS

Agreement	2 nd Qtr. FY- 2012	3 rd Qtr. FY- 2012	4 th Qtr. FY- 2012	Total Disbursed as of Sept. 30, 2012
	(Jan-Mar '12)	(Apr-Jun '12)	(July-Sep '12)	
Thermal Projects				
Muzaffargarh	-	\$2,776,388	\$743,903	\$8,392,791
Jamshoro	\$1,170,000	\$3,468,975	\$5,641,250	\$11,655,225
Guddu	-	-	-	-
Total Claim Submitted in Thermals	\$1,170,000	\$6,701,661	\$3,961,213	\$20,048,016

TABLE 1.1: FINANCIAL DISBURSEMENTS FOR SIX SIGNATURE PROJECTS

Agreement	2 nd Qtr. FY- 2012	3 rd Qtr. FY- 2012	4 th Qtr. FY- 2012	Total Disbursed as of Sept. 30, 2012
	(Jan-Mar '12)	(Apr-Jun '12)	(July-Sep '12)	
Hydro Projects				
Tarbela	\$370,000	\$670,000	-	\$11,249,917
Satpara	-	-	-	\$21,485,700
Gomal Zam	-	-	-	\$36,589,000
Total Claim Submitted in Hydros	\$370,000	\$670,000	-	\$69,324,617
Total Disbursements				\$89,373,633

As of September 30, 2012, the total amount of obligated funding for the Six Signature Projects was \$136, 731,075; as compared with the amount of disbursements of \$89,373,633.

HYDROPOWER PLANTS

With a total funding of \$82.5 million, as much as 163MW of generation are estimated to be added through the rehabilitation of Tarbela hydropower plant and completion of two multipurpose dams, Satpara and Gomal Zam. The baseline condition of Tarbela is tabulated below. For Satpara and Gomal Zam the baseline at the time of signing of the agreements was zero.

TABLE 1.2: CAPACITY IMPROVEMENTS AT THE TARBELA HYDROPOWER STATION

Tarbela Units under Rehabilitation	Baseline at the Time of FARA Signing		Baseline at Shut Down for Replacement	
	Capacity (MW)	MW Gains	Capacity (MW)	MW Gains
Unit 1	185	10	185	10
Unit 3	185	10	185	10
Unit 4	135	60	87	108
Total	505	80	457	128

TARBELA HYDROPOWER REHABILITATION PROJECT

Tarbela Dam was built in 1970's, with a total nameplate capacity of 3,478MW. The Tarbela FARA approved \$16.5 million for replacement of the SCADA system, digital governors, generator windings on units 1, 3 and 4, and capacity building for the Tarbela plant engineers.

At the FARA signing phase, the estimated gain in generating capacity was 80MW. However due to further deration in the generation capacity of



Overview of Tarbela Power House

unit 4, the estimated gain was increased to 128MW. As of September 30, 2012, the rehabilitation work has resulted in the total 128MW gain being achieved. The remaining replacement and repair work will increase the reliability and sustainability of the power plant, but not result in additional MW of capacity. The remaining work to be done includes replacing electromechanical governors with digital governors; up-grading the SCADA system; spare parts for unit 3 windings; and replacing one dewatering pump.

The rehabilitation work is anticipated to go beyond the completion date of December 2012 due to the delay in the procurement of digital governors and the SCADA system. The delay in procurement is due to extensive correspondence with the bidders/manufacturer for various clarifications necessary to finalize the contract and because of delays in securing visas and permissions from the Ministry of Interior for experts to visit the power plant. Therefore, this activity is expected to be completed in June 2013.

Total disbursement made to WAPDA as of September 30, 2012 is \$11,249,917 out of the total obligated amount of \$16,500,000. The current status of the Tarbela FARA is tabulated below.

TABLE 1.3: STATUS OF TARBELA REHABILITATION PROJECT- SEPTEMBER 2012

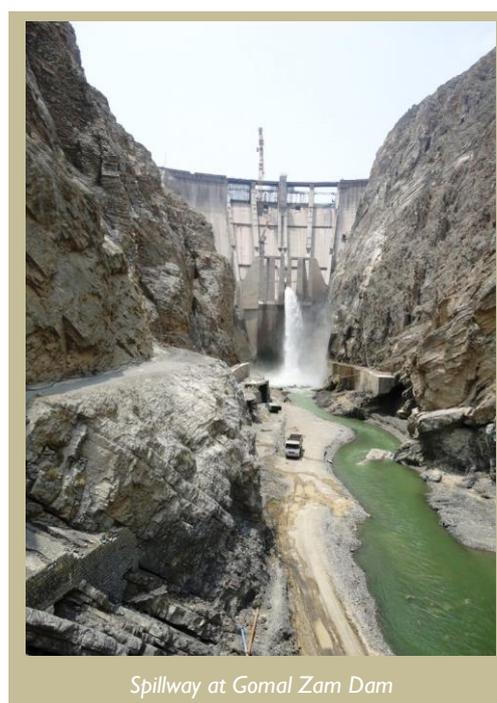
Line Item No.	Unit No.	Work Item Description	Amount (USD)	Claims Submitted (USD)	Present Status
1	4	Replacement of Damaged Generator Stator Windings with Class F Insulation Windings, Unit#4	3,700,000	3,700,000	Work completed and 100% amount reimbursed
2	3	Replacement of Damaged Generator Stator Windings with Class F Insulation Windings, Unit#3	3,700,000	2,849,917	Installation of windings completed on May 25, 2012. 100% amount-less spares-has been reimbursed. WAPDA has placed PO for the spares.
3	1	Replacement of Damaged Generator Stator Windings with Class F Insulation Windings, Unit#1	3,700,000	3,700,000	Work completed and 100% amount reimbursed
4	1-14	Upgrading of the SCADA System, Units 1-14	1,000,000		SCADA System was awarded in early August 2012 with a completion period of 14 months. Therefore, the testing and commissioning of this activity is scheduled to be completed in October 2013
5	1-10	Spare Seals & Guides for Relief & Bypass Valves on Turbine Side, Units 1-10	500,000	500,000	Installation completed on all units. 100% amount has been disbursed to WAPDA
6	1-10	Replacement of Electromechanical Governors by Digital Ones, Unit 1-10	3,000,000		Digital Governors were inspected by WAPDA Engineers at GE, USA and are scheduled for shipment in October 2012. The installation and commissioning of the Digital Governors on Units 1

Line Item No.	Unit No.	Work Item Description	Amount (USD)	Claims Submitted (USD)	Present Status
					– 10 is anticipated to be completed in June 2013
7	1-10	Replacement of Worn out Station Drainage & Dewatering Pumps, Units 1-10	400,000		Installation completed on all units.
8		Training	500,000	500,000	20 engineers from Tarbela power station have completed training on O&M in Switzerland. 100% amount disbursed to WAPDA.
		Total	16,500,000	11,249,917	

GOMAL ZAM MULTIPURPOSE DAM PROJECT

The Gomal Zam Multipurpose Dam Project (GZMDP) is located in South Waziristan in the Federally Administered Tribal Areas (FATA). When completed, the project will provide 17.4MW of generation and produce 91GWh/yr of electricity. It is expected to provide 1.14MAF of gross storage to support a new irrigation system and supplement an existing one with a combined area of about 191,000 acres. An Activity Agreement for GZMDP was signed on January 7, 2011, providing \$40 million of assistance for the completion of the main dam, hydropower and switch gear components, transmission line works and filling of the reservoir.

The main dam and spillway concrete and related works, along with mechanical testing of dam fixtures are 100% complete. Hydropower and switchyard components are 98% complete and stringing of the transmission line is in progress.



Spillway at Gomal Zam Dam

Filling of the reservoir started with the closure of the diversion tunnel, and the water level has increased to 722 meters. Final testing and commissioning of the project is dependent on the completion of the switchyard, transmission line, and filling of the reservoir to a normal operating level of 743 meters. However, completion of the Gomal Zam Dam powerhouse and switchyard may be delayed due to WAPDA's inability to make payments to its own contractors and due to high security risk in FATA. EPP is monitoring the completion of works and working closely with WAPDA to expedite work on the project.

During the reporting period, work on the Gomal Zam Dam was slowed down due to the abduction of eight WAPDA employees assigned to the project on Aug 15, 2012, and high security risk in the area. WAPDA is making efforts for the release of the abductees and EPP is keeping USAID apprised of the situation on a regular basis.

The total amount disbursed for this project as of September 30, 2012, is \$36,589,000. Project progress is tabulated in the following Table.

**TABLE 1.4: STATUS OF GOMAL ZAM MULTIPURPOSE DAM
PROJECT- SEPTEMBER 2012**

Line Item No.	Work Item Description	Completion Status	Agreement Amount (USD Million)	Claims Submitted (USD Million)	Present Status
1.	Main Dam, Spillways Concrete & Related Works	88%	19.171	19.171	Work Completed. Claim of 19.171 million reimbursed
2.	Hydropower & Switchgear Component	90%	0.757	0.757	Work Completed. Claim of 0.757 million reimbursed
3	Main Dam and Spillways Concrete & Related Works	91%	5.125	5.125	Work Completed. Claim of 5.125 million reimbursed
4.	Main Dam & Spillways, Concrete & Related Works	100%	5.125	5.125	Work Completed. Claim of 5.125 million reimbursed
5.	Hydropower & Switchgear Component	50% of remaining 10% works by Dec 9, 2011	0.920	0.920	Work Completed. Claim of 0.920 million reimbursed
5a.	Hydropower & Switchgear Component	100% by Jun 30, 2012	0.920		98% completed
6.	132kV Transmission Line & related works	50%	1.0	1.0	Work Completed. Claim of 1.0 million reimbursed
7.	132kV Transmission Line and related works	50% of remaining 10% works by Dec 9, 2011	0.5	0.5	Work Completed. Claim of 0.5 million reimbursed
7a.	132kV Transmission Line and related works	100% by Apr 30, 2012	0.5		95% Completed
8a.	Completion of Mechanical testing of Dam fixture	100%	2.0	2.0	Work Completed. Claim of 2.0 million reimbursed.
8b.	Completion of Project - Filling of Reservoir, Testing, & Placement in Commercial Operation	50% by Dec 9, 2011	1.991	1.991	Work Completed. Claim of 1.991 million reimbursed
8c.	Completion of Project - Filling of Reservoir, Testing, & Placement in Commercial Operation	100% by Aug 30, 2012	1.991		Final testing depends upon completion of transmission line, switchyard and availability of water
	Total		40	36.589	

THERMAL POWER PLANTS

With total funding of \$54.231 million, as much as 700 MW are estimated to be restored through rehabilitation of three thermal power plants, which will benefit more than 10.8 million individuals. The estimated MW gain for the plants at the time of signing of the FARA was 315 MW; however due to further deration in the plants' operational capacity, the estimated gain has increased to 700 MW.

TABLE 1.5: CAPACITY IMPROVEMENTS AT THE THERMAL POWER PLANTS

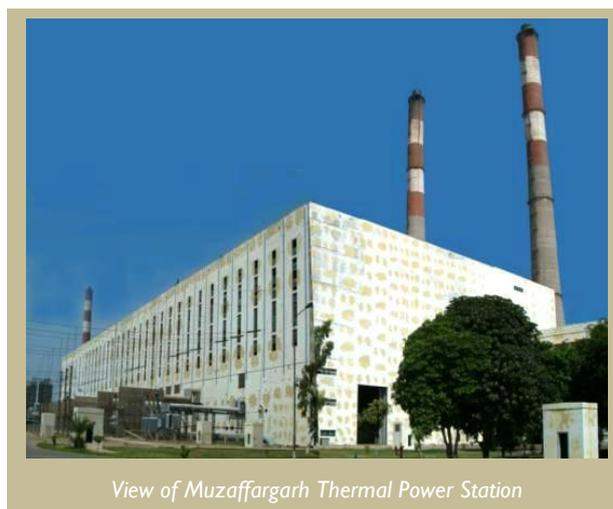
Thermal Plants under Rehabilitation	Baseline at the Time of FARA Signing		Present Operational Baseline	
	Capacity (MW)	MW Gains	Capacity (MW)	MW Gains
Muzaffargarh TPS	835	165	690	475
Jamshoro TPS	560	95	500	150
Guddu TPS	225	55	200	75
Total	1,620	315	1,390	700

MUZAFFARGARH THERMAL POWER STATION REHABILITATION PROJECT

The Muzaffargarh Thermal Power Station (TPS) consists of six conventional steam power generating units having total installed capacity of 1,350MW. As of March 2010, available generating capacity was only 690MW.

The FARA, signed on May 20, 2011, provided for \$15.193 million for rehabilitation and replacement of major equipment, training, and a Computerized Maintenance Management System (CMMS). The goal of the FARA was to improve the reliability and availability of the power station and to decrease the number of forced shutdowns. At the FARA signing phase, the estimated gain in generating capacity was 165MW, however due to further deration of the plant the estimated gain was increased to 475MW.

As of September 30, 2012, 280MW was restored at Muzaffargarh, due to rehabilitation of generating units 1, 2, 3 and 4, and the amount disbursed under the FARA was \$8.392 million. At that time, the project was scheduled to complete by November 30, 2012. However, a new Activity Agreement and Implementation Letter were signed in April to provide the GENCO with sufficient funds to make timely payments to vendors. The completion date per the revised activity agreement is June 30, 2013.



For the remaining FARA items, delays are anticipated in the procurement process due to the GENCO's weak financial standing to pay on time through a letter of credit. EPP experts worked with USAID in redefining the reimbursement process and revising the FARA to facilitate the GENCO in

making timely payments. Amendment No. 1 to the Activity Agreement, revised the completion date to November 30, 2012.

Immediate action on part of Ministry of Finance and Economic Affairs is required to work out details with the State Bank of Pakistan for allowing GENCO to access the disbursed amount from their Assignment Account. The EPP expert seconded at the Ministry of Finance is supporting the GENCO for resolution of the matter.

During the reporting period, monitoring visits were made by EPP to verify progress of the rehabilitation work. EPP experts also visited the fuel oil testing facilities at the plant and analyzed the plant's fuel measurement mechanism.

On Sept. 27, 2012, a meeting was held with USAID to discuss the expected megawatt gain at the plants. An update version of the MW gain sheet was submitted to USAID. EPP also informed USAID that NPGCL intends to purchase a computerized maintenance management system (CMMS) through opening a local letter of credit. USAID, after discussing with OFM, gave written approval for proceeding with opening of the local letter of credit. EPP communicated the decision to Muzaffargarh to expedite procurement.

The total amount disbursed for this project, as of September 30, 2012 is \$8,392,791¹. Project progress is tabulated in the following Table.

¹ EPP processed and submitted to USAID \$8,392,791. Out of which \$ 506,940 is under process with USAID.

TABLE 1.6: STATUS OF THE MUZAFFARGARH THERMAL POWER STATION PROJECT-SEPTEMBER 2012

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted under FARA	Claims Submitted under New PIL	Status
1	1, 2&3	Rehabilitation of Boiler super heater tubes to overcome failure of tubes	\$4,080,000	\$4,080,000		Material received and installed at site. 100% Claim reimbursed from USAID
2	1- 4	Special Cooling Water Treatment.	\$187,440			Tender opened for the fourth time on 26.06.2012 but no firm participated. It will be tendered again on 11.09.2012
3	1-6	Use of Fuel Oil Additive as done on Unit-4 (450 Tons).	\$921,225			Re-Tendered and opened in March 2012. Evaluation completed and file is under process for CEO approval
4	1, 2&3	Replacement of Cold layer element for RAH (2 sets)	\$170,000	\$170,000		Material received and installed at site. 100% Claim reimbursed from USAID
5	1, 2&3	Modification of Excitation system (3 set)	\$191,700			Tender opened in April 2012 and Bid Evaluation is in process
6	1, 2&3	Electric motors for C.T. Fan (02 No) and for GRC fan. (01 No).	\$184,245		\$184,245	PO was issued on 23.09. 2011 for electric motors while LC opened on 02.02 2012 for GRC fan. Material is expected to reach at site in October 2012. Claim for 100% Payment (\$184,245) reimbursed by USAID
7	3	D.C. Storage batteries (01 Set).	\$60,000	\$60,000		Material received and installed at site. 100% Claim reimbursed from USAID
8	1, 2&3	220Kv circuit breaker SF6 type (06 No).	\$337,605		\$337,605	LC established on 03.08.2012. Claim for 100% payment (\$337,605) received and forward to USAID/ENR for approval on September 25, 2012
9	4	Re-blading of LP. Rotor (LP Turbine Rotor blades of row (6&7), pins & locking device).	\$787,035			PO issued and LC opened on 02.02.2012. Claim for 100% Payment (\$787,035) received but the claim was turned down because one item in PO was not included in the PIL. NPGCL will retender the dropped item and then file the claim again
10	4	Air Pre-Heater Elements (Intermediate and Cold) 02 sets	\$255,000		\$255,000	Material received and installed at site. Claim for 100% Payment (\$255,000) reimbursed by USAID

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted under FARA	Claims Submitted under New PIL	Status
11	4	Up-grading of AVR System (01 set).	\$249,210			PO issued on 20.07.2012. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC
12	4	Replacing UPS 1&2. (01 set).	\$62,835			PO issued. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC
13	4	DEH (01 set).	\$319,500			Approved for Retendering due to high rate. Retender is expected to be opened on 18.09.2012
14	4	Up-grading of FSSS System (01 set).	\$138,450			Approved for Retendering due to high rate. Retender is expected to be opened on 18.09.201.
15	4	Up-grading of TSI system BNC 3300 or equivalent (Turbine Supervisory Instrument) (01 set).	\$266,250			Approved for Retendering due to high rate. Retender is expected to be opened on 18.09.2012
16	1-6	Training and software/hardware cost for CMMS and off-line efficiency monitoring system. All Units	\$1,000,000			Technical offer opened in Feb 2012 but it is now be retendered
17	5&6	I.D. Fan Rotor/Impeller along with Housing and Dampers (04 Set).	\$625,000	\$562,500		Consignment received on 26.02.2011 and installed partially at unit 5. 90% claim (\$562,500) reimbursed by USAID
18	5&6	Air Pre heater Elements Hot end, intermediate & cold end layers along with seals for both units (04 Set).	\$639,000			PO issued on 20.07.2012. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC
19	5&6	Procurement of G.R.C. Fan Impeller/Rotor (01 Set).	\$33,548		\$33,548	Po issued and LC opened on 27.01.2012. Material received at site on 16.07.2012. Claim for 100% payment (\$33,548) reimbursed by USAID
20	5&6	Procurement of Cooling Tower Fan Gear Box & its parts. (06 No. gear box).	\$236,963		\$236,963	PO issued and LC opened on 27.01.2012. Material received on site on 27.08.2012. Claim for 100% payment (\$236,963) reimbursed by USAID

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted under FARA	Claims Submitted under New PIL	Status
21	5&6	Economizer Tubes for both Units (02 Sets)	\$2,130,000		\$2,130,000	Po issued and LC opened on 05.04.2012. Material is expected to reach at site in October 2012. Claim for 100% Payment (\$2,130,000) reimbursed by USAID
22	5&6	IP Turbine Rotor (01 No).	\$641,130			PO issued on 14.06.2012. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC.
23	5&6	Replacement of Damaged Exhaust flue gas ducts of material Russian Grade Steel sheets (50 M.T), Plate Type Heat Exchanger for Inner Water Cooling System of Generator and Motor for Starting Oil Pump (Vertical) Units 5-6	\$287,550			Tender opened and LOI issued on 28.05.2012. PO issued on 29.06.2012. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC
24	5&6	Conversion of Boiler Ignition System from Natural Gas to HSD/Furnace Oil	\$277,965			Tenders opened and evaluation completed. LOI to be issued
25	5&6	Repair of winding and stator of Generators and testing	\$319,500			Draft tender documents sent to GM office on 06.08.2012
26	5&6	Hydraulic coupling of Boiler Feed Water Pumps (01 No).	\$63,900			Tender opened but only one firm participated and rate quoted by the firm is ten times higher than the estimated cost
27	5&6	Modification of Excitation System	\$166,140			Tender opened and is under evaluation
28	5&6	Procurement of 0.4KV Motors for Cooling Towers Fan and APH 02	\$10,650		10,650	PO issued and LC opened in April 2012. Material received at site on 10.08.2012 Claim for 100% payment reimbursed
29	5&6	Procurement of 6.6KV Motor for C.W. Pumps, CP, ID Fan, FD Fan & BF Pumps (05 No).	\$162,945		\$162,945	Po issued and LC opened in April 2012 Claim for 100% payment (\$162,945) reimbursed
30	5&6	Procurement of 6.6/0.4KV Breaker (5 No. 6KV breaker, 18Nos. 0.4Kv Breakers).	\$295,005			PO issued and request to establish LC of second PO has been made. Claim for 100% payment (\$295,005) rejected because LC of second PO was missing and was not opened

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted under FARA	Claims Submitted under New PIL	Status
31	5&6	Protection Relay for Generators.	\$29,820			Tenders opened and LOI issued on 24.02.2012. PO issued on 31.05.2012. Cash foreign budget allocated on 06.09.2012. CRRK office requested for establishment of LC
32	5&6	MK Breakers, Seal Oil Coolers, PMG	\$169,335		\$169,335	Consignment received at site. Claim for 100% payment (\$169,335) received and forwarded to USAID/ENR for approval on May 29, 2012.
33	5&6	Supply, Installation, Commissioning & Testing of complete distributed control system (DCS) including field equipment such as sensors, transmitter & actuators etc. for turbine governing system DEH-III and Boiler Turbine Auto regulation system YEWPACK-II	\$213,000			Retendered and bid evaluation in process.
34	5&6	Rehabilitation of Furnace safety Supervisory System (FSSS) including Furnace camera, flame monitoring & ignition system	\$266,250			Tender opened and is under process.
Total			\$15,778,195	\$ 4,872,500	\$ 3,520,291	

JAMSHORO THERMAL POWER STATION REHABILITATION PROJECT

The Jamshoro Thermal Power Station (TPS) has four generating units. Unit 1 uses only high sulfur fuel oil (HSFO). The other three Units are dual-fuel, using HSFO, or gas, or a blend. Due to the national shortage of electricity over the past few years, routine maintenance was not carried out at scheduled intervals and spare parts procurement for was not maintained. As a result, the plant's capacity has been de-rated from 850MW to about 500MW.

The Jamshoro TPS FARA approved \$18.36 million for replacement of major equipment at the plant, such a high pressure heaters, super heaters, economizers and air preheaters. At the time of the FARA signing in May 2010, the anticipated gain in generating capacity was 95MW. However due to further deration in the plant, the estimated gain has been increased to 150MW. This is expected to produce an additional 598GWh/year of electricity for the national grid and an estimated improvement in heat rate of 4%. The benefit of fuel cost savings will be more than \$30 million per year at a 50% plant factor. Moreover, the rehabilitation work will increase plant reliability by 4%-5%, resulting in additional power generation of 285GWh per year. Expected annual fuel saving benefit of \$ 30.0 million is almost twice the \$18.36 million cost for rehabilitation/replacement of equipment.

Two FARA items (Air Pre-heater elements and seals at Unit-1 and Autoburner Control System) have been replaced which added a total of 25MW. For the remaining FARA items, delays are anticipated in the procurement process due to the GENCO's weak financial standing to pay on time through a letter of credit. EPP experts worked with USAID in redefining the reimbursement process and revising the FARA to facilitate the GENCO in making timely payments. The signing of an amended FARA is awaited to expedite disbursements.



Immediate action by the Ministry of Finance and Economic Affairs is required to work out details with the State Bank of Pakistan to allow the GENCO to access the disbursed amount from its Assignment Account. The EPP expert seconded at Ministry of Finance is supporting the GENCO to resolve the matter.

A new Activity Agreement and Implementation Letter were signed in April providing the GENCO with sufficient funds to make timely payments to the vendors. The completion date per the revised activity agreement is June 30, 2013. To ensure environmental compliance and implementation of EMMP, EPP contracted with an engineering firm to carry out a site visit and audit in April. During the audit, observations were made and issues were shared with the plant management to take necessary corrective actions. An environmental audit report was submitted to the USAID/ENR.

Procurement of the remaining items is progressing, and letters of credit for three PIL items 2, 15, 19 were opened by Jamshoro TPS at 0% cash margin. The total amount disbursed for the project as of September 30, 2012 is \$11,655,225. The status of the JTPS Activity Agreement is tabulated in the following Table.

TABLE 1.7: STATUS OF THE JAMESHORO THERMAL POWER STATION REHABILITATION PROJECT-SEPTEMBER 2012

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted on the Basis of Old FARA	Claims Submitted on the Basis of New PIL	Present Status
1	1	Rehabilitation of Air Pre-heater Side A&B Rotor.	\$1,672,050			PO has been issued to M/S Howden Spain on 23.08.2012. Allocation of foreign exchange received from DG (B & C) WAPDA on 06-09-2012. RRK is requested to establish the L/C at the earliest.
2	1	Replacement of Final Super Heater Coils.	\$958,500		\$958,500	Foreign Exchange allocation received on 9.08.2012. L/C established. Claim for 100% payment received and forwarded to USAID for approval on September 26, 2012
3	1	Complete replacement of Flue Gas Duct & Air Pre-heater Bottom hoppers and F.D Fan duct up to steam coil Air Heater.	\$720,000	\$720,000		The consignment received at JPCL on 16.01.2012. Installation completed. 100% Claims reimbursed
4	1	Complete Rehabilitation of Cooling Towers.	\$500,000	\$450,000	\$50,000	Material received at Jamshoro. Installation completed. 100% claim reimbursed
5	1	Up gradation / replacement of Auto Burner control system and Data Acquisition System.	\$300,000	\$300,000		Material received and installed at site. 100% Claim reimbursed by USAID.
6	1	Hiring of services for major overhauling.	\$810,000			The tender opened on 20.02.2012. Only one firm M/s IED Ukraine through their local agent M/s Istil Karachi participated in the tender. The case will be finalized soon
7	1	Soot Blower Spare Parts.	\$117,150			L/C opened on 28.12.2011. Material received at site on 12.05.2012 but specifications mentioned in PO are different from PIL specifications. EPP observations/recommendations sent to USAID for decision

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted on the Basis of Old FARA	Claims Submitted on the Basis of New PIL	Present Status
8	1	Tube Bundles of Steam Converter, unit#1	\$250,000	\$225,000	\$25,000	Material received at site on 21.11.2011 and installed. 100% Amount reimbursed by USAID
9	1	Spares for Oil & HSD Burners & Igniters.	\$213,000			L/C Established on 28.12.2011 and material received at site but specifications mentioned in PO differs from PIL specifications. EPP Observations/recommendations sent to USAID for decision
10	1	Air Pre-heater Elements & Seal,	\$670,000	\$670,000		Material Installed at site amount reimbursed. 100% Claim reimbursed by USAID.
11	1-4	Use of fuel oil additives to prevent slag formation and cooling water treatment chemicals to prevent scale buildup.	\$958,500			Tender was opened on: 17.02.2012. The case was sent to GM (Th.) for their expert opinion. It has been decided that fresh tender will be invited and opened by the office of GM Thermal Lahore
12	2-4	Replacement of H.P Heaters along with the valve and controllers including Rehabilitation of Instrument Control & Protection System.	\$3,306,825		\$3,306,825	L/C Established on 30.09.2011.The material reached at site on 07.08.2012. Claim reimbursed by USAID
13	2-4	Complete Rehabilitation of Cooling Towers.	\$718,875			L/C established on 27.06.2012, but it was not as per PIL specifications. Claim will be submitted after procuring the remaining items
14	2-4	Complete Rehabilitation of drain valves.	\$351,450			L/C Established on 28.12.2011. The material reached at site on 26.06.2012but specifications mentioned in PO differ from PIL specifications. EPP observations/recommendations sent to USAID for decision
15	2-4	Rehabilitation of soot blowing system.	\$702,900			Foreign Exchange Allocation received on 31.07.2012. L/C has been established

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted on the Basis of Old FARA	Claims Submitted on the Basis of New PIL	Present Status
16	2-4	Supply, installation and commissioning of complete economizers of three units	\$3,195,000		\$3,195,000	L/C has been established on 28.06.2012. Material is expected to reach site in September 2012. Claim for 100% Payment reimbursed by USAID
17	2	<p>a. Modification/Rehabilitation of Electro Hydraulic and Mechanical Hydraulic Governing system.</p> <p>b. Replacement of Data Acquisition System (DAS-100), Auto Regulation System (MZ-III) and Temperature Scanners for Generator Winding Temperature, Super Heater/Re-Heater Temperature, Boiler Drum Metal Temperature, F.D, I.D Fan motor Temperature, Boiler Feed Pump Temperatures with latest Distributed Control System (DCS).</p> <p>c. Replacement of existing FSSS along with Furnace Flame Monitoring on one unit. Replacement of Data Acquisition System (DAS-100), Auto Regulation System (MZ-III) and Temperature Scanners for Generator Winding Temperature, Super Heater/Re-Heater Temperature, Boiler Drum Metal Temperature, F.D, I.D Fan motor Temperature, Boiler Feed Pump Temperatures with latest Distributed Control System (DCS).</p> <p>d. Replacement of Turbine Vibration system with Vibro-Control-4000 Schenk or equivalent.</p>	\$1,171,500			Tender opened on 17.07.2012 and technical bids are under evaluation

Line Item No.	Unit No.	Work Item Description	Agreement Amount	Claims Submitted on the Basis of Old FARA	Claims Submitted on the Basis of New PIL	Present Status
18	2	Procurement of Boiler Feed Pump Motor Complete.	\$117,150		\$117,150	L/C was opened on 28.12.2011 and the equipment reached site. Claim for 100% Payment reimbursed by USAID
19	3	Replacement of Final Super Heater Coils.	\$958,500		\$958,500	Foreign Exchange Allocation received on 31.07.2012. L/C has been established. Claim for 100% payment received and submitted to USAID for approval.
20	3	Three-Way valve of Oil burner.	\$200,000	\$180,000	\$20,000	Material received at JPCL on 23.11.2011 and is installed. 100% Amount has been reimbursed by USAID
21	3	Spares for Overhauling of Turbine.	\$532,500			Consignment reached Jamshoro but specifications mentioned in PO are different from PIL specifications. EPP observations/recommendations sent to USAID for decision
22	4	I.D Fan Impellers.	\$479,250		\$479,250	Purchase Order issued on 16.03.2012. LC established on 28.06.2012. Claim for 100% Payment reimbursed by USAID
23	1-4	Off-line Efficiency Monitoring system and training.	\$426,000			Tender opened on 29.05.2012 and bids are under evaluation.
		Total	\$19,329,150	\$2,545,000	\$9,110,225	

GUDDU THERMAL POWER STATION REHABILITATION PROJECT

The Guddu TPS was constructed in phases from 1974 to 1994 and has a capacity of 1,655MW. It consists of 13 units: units 1-4 are conventional steam power units; units 5-10 make up a 600MW combined cycle plant (CCP) using equipment from General Electric, USA; units 11-13 make up another 415MW CCP using equipment from Siemens, Germany.

A FARA was signed on May 20, 2010, providing \$18.068 million to up-grade Block-I, which consists of the steam turbine unit 5 (ST-5), along with gas turbine units 7 and 8 (GT-7 and GT-8), each of which are 100MW nominal capacity units. This upgrade will increase GT firing temperature, upgrade controls, replace existing base control wiring, upgrade the existing excitation system with a Digital Static Excitation system EX2100 including sensors, install hi-flow IGV modification, and other ancillary measures. Upgrading Block-I is expected to increase generating capacity by 75MW, provide an additional net energy output of 507GWh per year, and improve the heat rate by 3.59%. This would result in a projected saving of \$3.5 million per year.

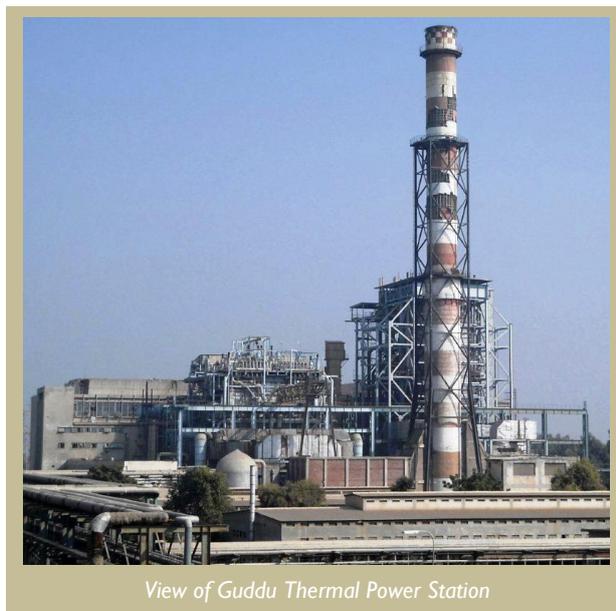
Although the FARA was executed, the project was delayed due to a series of negotiations and price disagreements between GE and Guddu management. EPP has been working with USAID/ENR and providing technical assistance for revising the FAR Agreement. The amended agreements are expected to revise milestone dates, expedite payments and guarantee funds availability for international procurement.

After a series of negotiations with GE on the upgrading of Block-I (one of the two 255-MW General Electric Combined Cycle Plants (CCP)), Guddu management reached an agreement with GE. As a result, GE provided a

revised performance bank guarantee and placed a Purchase Order of the equipment in April 2012. The uprate, upgrade and overhaul will increase the capacity of the plant by about 75-00MW (higher than the earlier expected increase of 55MW), improve its efficiency by about 3.4%, and improve the reliability of the system by upgrading the obsolete gas turbine and steam turbine control systems.

Delays are anticipated in the procurement process due to the weak financial standing of the GENCO and inability to pay on time through a letter of credit. EPP experts worked with USAID and the GENCO in redefining the reimbursement process and revising the FARA to facilitate the GENCO in making timely payments. New Activity Agreements and Implementation Letters were signed in April allowing the GENCO to have sufficient funds to make timely payments to the vendors. The completion date per the revised Activity Agreements is June 30, 2013.

In September, EPP staff held meetings with the senior management of GTPS regarding the planned rehabilitation work. Discussions were also held on the fuel oil handling systems and the related



View of Guddu Thermal Power Station

SOPs. The team also visited the fuel oil testing facilities at the chemical lab of the plant. During the reporting period, monitoring visits were made by EPP to GTPS to verify work progress.

DEGREE TO WHICH TARGETS WERE MET AND RESULTS ACHIEVED

The rehabilitation work at the signature projects has provided an increase in generating capacity beyond the original estimates for the projects. For example, Tarbela Dam achieved a total increase in generation of 128MW, about 60% above the projection of 80MW as estimated at the time the FARA was signed. And the Muzaffargarh thermal generation station is expected to gain 475MW of capacity, as compared with an original estimate of 165MW. This improvement in available generating capacity is due to several factors:

- The condition of the generating plants had deteriorated more than estimated due to poor maintenance and additional deterioration of facilities that took place between the time the project agreement was signed and the beginning of the rehabilitation work.
- The plants often do not have sufficient instrumentation or data needed for an accurate projection of performance parameters, so planners are prudent in estimating expected gains in generation.
- The generating plants can be upgraded to a higher quality level, largely due to advancements in technology, so that the plants can operate above the level of installed capacity. These additions to generating capacity can be achieved at no additional cost of the upgrade.

Several of the projects have had the time to complete the rehabilitation work extended beyond the original estimate. These extensions did not add to the total cost of the upgrade, but were due to several factors:

- Delay in procurement of equipment needed for the upgrade. This is largely due to extensive and lengthy negotiation and correspondence with equipment vendors and clarifications needed to ensure that the proper equipment is procured (Tarbela Dam; Guddu TPS).
- Security concerns and lack of access to facilities located in remote areas (Satpara Dam and Gomal Zam Dam)
- The weak financial condition and inability to secure letters of credit to support the procurement process at several facilities has resulted in delays in the procurement process (Muzaffargarh TPS; Jamshoro TPS ; Guddu TPS)

COMPONENT TWO: POLICY REFORM

EPP's policy reform work is intended to help policy makers address issues that severely impact the sector's performance in delivering electricity supplies to the people of Pakistan in a commercially, sustainable manner. The EPP support is provided to the decision makers through one of two mechanisms, namely:

- Undertaking specific activities, as requested by GOP counterparts; and
- Seconding advisors and specialized support staff to provide institutional support to GOP counterparts.²

Shortly after initiating Phase II USAID requested, EPP and the Power Distribution Program to jointly identify priority policy issues for improving the overall governance and performance of the energy sector, and to identify selected problems, desired policy prescriptions, roles of stakeholders, and resources required to move forward. As a consequence, a USAID priority policy matrix was drafted and finalized in May 2012.

Since developing the policy matrix EPP support is, in general, predicated on helping address or alleviates the identified priority policy issues: (i) Mounting circular debt; (ii) insufficient supply of affordable electricity; (iii) inefficient power sector operations and excessive sector energy losses; (iv) poor governance and management of public energy sector entities; and, (v) excessive peak demand in summer.

EPP has in place six long-term advisors who are co-located within the Ministry of Water and Power, the Ministry of Finance, and Ministry of Petroleum and Natural Resources, associated line ministries and key power sector enterprises (PSEs) The long term advisors are complemented by supporting professionals including policy analysts and international and local experts/specialists will be deployed where they can best perform their activities. In addition to the imbedded advisors, EPP has utilized energy sector professionals to undertake or supported studies to determine the impacts of the prevailing situation in the sector.

The activities carried out are described in more detail in the following paragraphs.

SUPPORT TO THE MINISTRY OF WATER AND POWER

EPP is supporting the Ministry of Water and Power to implement the GOP's Power Sector Reform Program (PSRP) in generation, transmission, fuels, policy and finance.

- EPP's three seconded staff at MWP work on a day-to-day basis with the MWP Secretary, Special Secretary, Additional Secretary, and Joint Secretary, provide technical assistance and advise on energy sector issues. This regular interaction provides a platform for developing a strong level of trust and a congenial working environment in support of ongoing reform efforts. EPP's activities to date include: Developing briefing documents on fuel oil management issues, GENCO rehabilitation results, and the development of a model for monitoring the performance of the energy sector;

² USAID approval is required before providing any support through either mechanism.

- Developing a model for analyzing the performance of the energy sector
- Developing a financial model to calculate the long-term benefits of introducing smart meters on the Pakistan power system and analyze related key financial statistics
- Developing and presenting regional country energy sector profiles comparing generation mix, energy policy, renewable energy and other key information related to the energy sectors
- Developed an analysis on key performance indicators for DISCOS and identified areas that could be improved to reduce transmission and distribution (T&D) losses. Data on bill collection, defaulters, and pending billing cases were collected and analyzed. Based on the analysis, a case study was prepared on LESCO and submitted to MWP
- Initiated work to develop a financial model to estimate the revenue shortfall of the power sector for the next fiscal year. The model includes an analysis of revenues, payables, subsidies, etc

.. SUPPORT TO THE MINISTRY OF WATER AND POWER – PSEs

CIRCULAR DEBT

During the reporting period, EPP provided support to finalize the paper on power sector circular debt. The paper, which was drafted in collaboration with the USAID Power Distribution Program, includes a comprehensive study of circular debt – including the primary and secondary causes for the rising amount of circular debt and recommendations for its reduction and eventual elimination.

POWER SECTOR ANALYSIS – GENERATION & DISTRIBUTION

Upon the Joint Secretary's (Power) request, a report analyzing the past five years data on generation and distribution in the power sector was prepared and submitted to MWP.

PSEs PAYABLES REPORT

EPP prepared an overview of the updated payables for the entities within the power sector, which was submitted to MWP.

GENCO HOLDING COMPANY

A report highlighting the different financing facilities used by the power sector through the Power Holding Company was prepared and submitted to MWP.

FINANCIAL MODELING AT CPPA

EPP initiated work on improving the data entry process at the Central Power Purchasing Agency (CPPA) and to bridge the communication gap between MWP and CPPA. EPP met with CPPA Treasury Department at WAPDA House, Lahore to gather information on the financial modeling process being used by CPPA and their mode of operation. The current methodologies used at CPPA were evaluated and the findings documented in a memo. The memo entails recommendations on

improvements in the CPPA financial model as well as a roadmap for improving communication between CPPA and MWP. EPP shared the memo with MWP and is awaiting its review and approval.

SUPPORT TO THE MINISTRY OF WATER AND POWER – ENERGY EFFICIENCY

- EPP was asked to provide the MWP with policy advice on where the Federal Government could legitimately move forward in supporting energy efficiency. EPP developed a list of options for the GOP. After receiving feedback from the provinces, the proposed changes were incorporated and a final draft bill prepared in consultation with MWP, which is moving forward in areas under its authority without CCI concurrence. This includes staffing and strengthening of ENERCON, new Energy Saving TIPS, and other areas.
- EPP provided policy advice on building a basis for the passage of the Draft Bill on Energy Efficiency. Stakeholder consultations were organized to receive feedback and achieve consensus among provincial and federal stakeholders. The Draft Bill was finalized in agreement with the Council of Common Interests (CCI) in a final stakeholder meeting held in April 2012. The Draft Bill has been forwarded to the Cabinet and Law Division for review.

ENERGY EFFICIENCY (INSTITUTIONAL STRENGTHENING/CAPACITY BUILDING)

- EPP provided assistance to help rebuild ENERCON (The National Centre for Energy Conservation). With EPP's assistance, an organizational transformation plan for ENERCON was developed. Also EPP conducted employee surveys and developing a blueprint including position descriptions and recruitment plan and provided assistance in hiring competent staff for key positions.
- EPP staff provided ENERCON with a roadmap for energy conservation and energy efficiency activities and discussed the modus operandi to develop a policy to phase out incandescent light bulbs and for initiating an energy efficiency program for Pakistan.
- EPP facilitated a meeting of provincial stakeholders and ENERCON in which preliminary discussions were held on the use of energy efficient lighting and phasing out of incandescent bulbs.
- EPP facilitated ENERCON in joining the Global Efficient Lighting Partnership organization, which provides technical support for energy efficiency lighting policies to its members.

RENEWABLE ENERGY POLICY

- EPP worked in collaboration with the Alternative Energy Development Board (AEDB) to develop medium-term small-scale renewable energy policies for the country.

ENERGY EFFICIENCY FINANCING MECHANISMS

- EPP prepared a memo on energy financing mechanisms, including barriers, and the role of energy service companies (ESCOs) in promoting energy efficiency mechanisms.

SUPPORT TO THE MINISTRY OF FINANCE

LNG IMPORT RESEARCH

- EPP analyzed the price trends of Brent Crude and other oil indexes, the current global landed prices of LNG in South Asia and internationally. EPP also assisted in the evaluation of the LNG policy on behalf of MOF.

TARIFF DIFFERENTIAL SUBSIDY AND TARIFF REFORM

- EPP evaluated tariff subsidy mechanisms implemented globally, the current subsidy mechanism in place in Pakistan, and the fiscal impact of the subsidy and made recommendations to the GOP and MOF.

Based on a detailed analysis of the tariff differential subsidy and its impact on the sector, EPP developed a proposal for improving the targeting of the subsidy to lower income households.

POLICY REVISION FOR GRANT OF SUBSIDY TO TUBEWELLS CONSUMERS IN BALOCHISTAN

- EPP provided assistance to MOF in preparing a revised policy for granting a subsidy to tubewell consumers in Balochistan in order to reduce the federal government's share of the subsidy and increase the provincial share.

PRIVATE SECTOR HYDEL POWER GENERATION PACKAGE

- EPP provided assistance to MOF in preparing a policy framework and a package of incentives to encourage private sector hydel power generation.

TARIFF DIFFERENTIAL SUBSIDY AUDIT

- EPP assisted the Corporate Finance Wing (CFW) in preparing the Terms of Reference (TOR) for the planned Tariff Differential Subsidy. EPP continued providing assistance to the Corporate Finance wing in developing TORs for the Tariff Differential Subsidy Audit³.

³ In August, the Ministry of Finance requested assistance from EPP in developing preparing the Terms of Reference (TOR) for the planned Tariff Differential Subsidy.

POLICY FOR POWER GENERATION BASED ON BIO WASTE AND BAGASSE OF SUGAR MILLS

- EPP was requested to review a policy to promote the sale of excess power generation at sugar mills to the power grid to help reduce unplanned power outages. Upon review of the draft policy summary, EPP made a recommendation to map the sugar mills' surplus generating capacity, efficiency and distance to the grid station to help determine the economic viability of power purchase agreements for these entities.

TIME OF USE METER POLICY (TOU)

- EPP briefed the Corporate Finance Wing about TOU meter policy and its implementation by the distribution companies.

SUPPORT TO THE NATIONAL TRANSMISSION AND DISPATCH COMPANY (NTDC) & NATIONAL POWER CONTROL CENTER (NPCC)

NTDC BUSINESS PLAN

EPP prepared a NTDC Business Plan. As a result the Planning Department of NTDC overhauled its technical assessment and its near-term capital program. NTDC recommended additional in-depth technical assistance in performance audits, benchmarking, and learning about best practices applicable to NTDC.

IMPROVING ENERGY SUPPLY

- EPP completed a 'Study on Evaluation of Economic Dispatch' at NPCC by analyzing NPCC procedures, developing a gap analysis of what is required for economic dispatch, and evaluating the efficacy of NPCC's existing economic dispatch models. This study encompasses a review of NPCC's dispatch function; identifies impediments to effective implementation of the Economic Dispatch Model; and provides recommendations for overcoming those impediments. Standard Operation Procedures for NPCC
- EPP continued working on developing Standard Operating Procedures (SOP) for the National Power Control Center (NPCC). The objective is to develop a standard framework for operations.

CONTINGENCY PLAN FOR NPCC

- EPP developed a draft contingency plan for NPCC. The contingency plan will provide backup procedures in the wake of a power system emergency. The contingency plan will serve as a guide to NPCC and encapsulate agreed upon actions to be taken and set procedures to be activated in response to identified emergencies ranging from relatively mild that can be locally contained, to catastrophic requiring moving to a backup offsite facility to ensure safety of assets and employees and continued availability of essential services.

INDUCTION TRAINING MANUAL (ORIENTATION & OPERATIONS) FOR NPCC

- EPP developed an Induction Training Manual (Orientation & Operations) for NPCC's new recruits and existing operators. The draft manual was completed and sent to NPCC for review.
- an EPP senior energy expert was seconded to work as an advisor to NTDC/NPCC in July 2012. The expert has provided assistance to NPCC on improving load management and has recommended improvement in management of the National Power Control Center, including development of an action plan for MWP on the reduction of line losses.

TRANSMISSION COORDINATION TEAM

- EPP technical experts worked on reviewing the 132/66 and 33KV related transmission activities of the distribution companies. The Team:
 - discussed methods for selecting and evaluating distribution companies suffering high transmission system technical losses.
 - visited distribution companies at Hyderabad (HESCO), Lahore (LESCO) and Faisalabad (FESCO) and GEPCO, collecting 132KV data to analyze system performance. EPP transmission experts visited the Peshawar Electricity Distribution Company (PESCO) to discuss transmission and operational issues and problems.

IMPORT OF POWER

- EPP transmission experts visited Kabul, Afghanistan to explore the possibility of exporting power from CAR countries to Pakistan, using Afghanistan's transmission network.
- EPP Transmission experts also held a series of meetings with senior NTDC officials in Lahore regarding the Regional Power Import Program from the Central Asian Region through Afghanistan. Discussions took place on the possible entry points of the proposed Kabul-Peshawar transmission line and its interconnection with the existing network in Peshawar. Support to Ministry of Petroleum and Natural Resources

SHALE GAS

- EPP reviewed options for exploitation of Pakistan's shale gas resources and prepared terms of reference for supporting the MPNR by conducting resource and production technology assessments.
- EPP reviewed options for supporting the MPNR's August 2012 exploration and production policy

DOWNSTREAM OIL POLICY

- an EPP expert was seconded to a committee to draft a refining policy and ex-refinery pricing mechanism.
- EPP initiated work on formation of a draft policy

LNG IMPORTS

The EPP expert seconded to MNPR provided technical support for the LNG Import Program to the Secretary and Additional Secretary MPNR and Directorate General (DG) Gas as follows:

- Explored various options for the LNG import program. Supported the DG Gas office in developing a revised project structure for LNG imports for the short- and long-term.
- Supported MPNR on the proposed LNG import program.
- Supported the LNG Committee
- EPP invited expressions of interest (EOI) from various companies to acquire consulting services associated with developing an LNG supply chain

SUPPORT TO THE ENERGY WING OF THE PLANNING COMMISSION

PERIC (PAKISTAN ENERGY RESEARCH AND INFORMATION CENTER)

EPP developed a concept paper on setting up a Pakistan Energy Research and Information Center (PERIC), This institution would cover policy/advisory services to the energy sector, maintain a dataset of the industry and conduct specialized studies.

ECC SUMMARIES

During the reporting period, EPP provided support in drafting the following documents for the Economic Coordination Committee:

- Brief, Working Paper and PC-1 of Neelum Jhelum Hydroelectric Project.
- Summary on ‘Delay in Payments By The Power Purchaser To IPPs Under Power Policy -2002.’
- Summary on ‘Offloading Energy Sector Projects from Public Sector Development Program.’

GENERAL SUPPORT TO THE PLANNING COMMISSION

EPP staff seconded at the Planning Commission provided support to the Commission as follows:

- Drafted comments on release of funds Rs 900 million for 2X50 MW Power Plant from SYNGAS (IGCC-2009).
- Prepared brief notes for the Finance Minister on Karachi Coastal Nuclear Power Plants.
- Prepared a brief for Deputy Chairman Planning Commission on the Natural Gas Efficiency Project.
- Drafted minutes of the meeting on the automated billing system held on 2nd July, 2012 at the Planning Commission.
- Prepared comments on a summary to ECC on delayed payments to IPPs by power purchasers.
- Finalized the comments and criteria for the installation of solar tube wells systems throughout Pakistan.
- Compiled an analysis of the tariff differential subsidy given to the power sector by the Government of Pakistan.

- Compiled a brief for the Prime Minister on the Neelum Jhelum Hydroelectric Project covering all aspects of the project, such as updated cost projections, source of financing, funds allocation from PSDP (Public Sector Development Program), current status, and considerations by the CDWP (Central Development Working Party) and ECNEC (Executive Committee of the National Economic Council).
- Updated and modified a summary for the ECC on the time of use (TOU) tariff metering system.
- Developed comments of the Planning Commission on the following summaries:
 - Adjustment of petroleum prices on a weekly basis;
 - Delayed payments to IPPs;
 - Import of furnace oil by PSO under a term contract;
 - Allocation of gas to fertilizer plants from alternate sources; and
 - Marketing of LPG in the country
- Prepared a presentation focusing on the import of LNG into country mainly for power generation.
- Finalized the summary to the Economic Coordination Committee of the Cabinet on time of use (TOU) tariff metering.
- Created and finalized a brief on criteria for the distribution of solar systems to farmers. The brief covers essentials for the process of solar system distribution e.g. criteria for selecting vendors, application process, and the benefits that the Government of Pakistan would achieve from the project.
- Communicated with the Director General (Liquefied Gases), Ministry of Petroleum and Natural Resources (Policy Wing) regarding the meeting held on importing LNG into country.
- Formulated a brief for the Secretary Planning and Development Division on the status of hydro power projects in Gilgit Baltistan and Azad Kashmir areas.
- Prepared a brief for the Secretary Planning and Development Division on delay in payments to the IPPs by the power purchaser under the 2002 power policy.
- Additional IT support was provided in resolving issues arising in IT equipment provided in the Member Energy's office. Routine updating of software and troubleshooting was also carried out as required.

CAPACITY BUILDING

ENERGY SECTOR INTERNSHIP PROGRAM

EPP worked on finalizing the operational details of the internship program. In this regard, the EPP team held several meetings with various power sector entities and academic institutes and discussed the modalities of the EPP internship program. During the reporting period the recruitment process for of interns was initiated. In the first round of the process, applications were solicited for placement in Sindh and KPK. More than 400 candidates applied for the positions. Applicants were screened and shortlisted on a selection criterion based on academic qualifications, geographical location, and gender. Written tests and interview of the shortlisted candidates are planned to be held in October.

ENERGY SECTOR SEMINAR

As a part of its outreach program to increase awareness of USAID's efforts, EPP has a planned a series of seminars on energy issues for universities, industry and civic society organizations. EPP

organized an interactive seminar on the energy crisis in Pakistan and effective energy saving habits at the Roots International School in Islamabad. The seminar was attended by 70 students as well as by faculty members. The students were given an overview of the energy sector, including the sources of electricity generation in Pakistan, demand and supply statistics, and electricity consumption patterns. The students were also given an orientation about the EPP project and its initiatives as well as the contributions made to Pakistan's energy sector by USAID.

DEGREE TO WHICH TARGETS WERE MET AND RESULTS ACHIEVED

The overall goal of the Component 2 activities is to help Pakistan enhance its energy sector governance framework and will result in increased availability of commercially sustainable electricity supply so that the country is able to continue to grow economically.

Issues Arising: Since initiating phase II, frequent senior level personnel changes at the MOWP and other key PSEs has created a challenge in ensuring effective support and have contributed to delays in formulating and implementing reforms⁴. However, going forward, it is anticipated the current senior staff at the various Ministries and PSEs (MOWP, GENCO Holding Co., MOF and MPNR) will continue to serve for the foreseeable future. As such, it is anticipated the guidance and advice being provided through EPP can help the country in addressing some of the fundamental policy issues.

Activity Summary: Working with the GOP and the several Ministries involved in the energy sector, EPP has provided six long term advisors who have provided policy advice on many priority policy issues: (i) *Mounting circular debt*; (elimination of the tariff differential subsidy, tariff determination methodology) (ii) *insufficient supply of affordable electricity* (development of indigenous energy resources; energy imports);(iii) *inefficient power sector operations and excessive sector energy losses* (energy efficiency and increasing conservation, reduction in line losses.:(iv) *poor governance and management of public energy sector entities* (electricity theft), and (v) *excessive peak demand in summer* (energy efficiency and increasing conservation). In the next twelve months, it is anticipated a further four to six long term advisors will be added to the Ministries and PSEs in addition to those currently serving on a long term basis. They will also be supported by several short term consultants and specialist subcontractors.

Quantification of Benefits: Till recently there was limited sector- wide information exchange on the overall sector performance. In recognition of this, at the end of August 2012, the MOWP appointed a Special Secretary who is charged with leading a Monitoring/Coordination Cell to routinely evaluate the overall sector performance⁵. As a first step EPP is supporting the development of a sector-wide monitoring and evaluation model that will provide critical information on the sector in a timely fashion.

When implemented this tool should enable improved quantification of the impact of EPP-supported policy reform measures. There is no doubt EPP's efforts have succeed in adding MW to the Pakistan

⁴ For example, there have been two changes at Secretary level at MOWP since Phase II was initiated. The changes in senior-level leadership have also resulted in changes in personnel at Special Secretary, Joint Secretary level as well as in the executive management of critical PSEs.

⁵ See GOP internal document MoWP U.O. No. SS (W&P) 74/12, dated 31st August 2012: Secretary General to the President's Secretariat, Islamabad

power grid; improved the operational efficiency of NTDC; provided technical support and capacity building to GOP Ministries (MWP; MOF; NTDC; NPCC; PC; MPNR); and provided the basis for sustainable long-term policy reform. However, in the absence of appropriate monitoring and evaluation tool, it is difficult to directly quantify the impacts of the various support provided to date.

Strategy and Implementation Approach: Going forward, our strategy is to support the GOP in prioritizing and quickly implementing high impact policy reform measures aimed at alleviating the sector crisis and with sustainable positive benefits for all segments of society. This will be done, where appropriate, in coordination with PDP.

To ensure that future assistance to the Ministry of Water and Power, associated line Ministries, and government agencies/entities⁶ results in policies that are quickly implementable; have high-impact, positive benefits; consider the impact on women and the poor; and are sustainable, EPP will screen and prioritize support to policy reform options.

To facilitate expeditious reform, we will work through existing policy development and setting channels, including but not limited to the recently formed Coordinating/Monitoring/Finance Cell, headed by Special Secretary, Ministry of Water and Power, the Economic Coordination Committee (ECC) of the Cabinet, and the Prime Minister's Energy Management Committee. Before commencing new support activities, concurrence from USAID will be obtained.

In determining what activities to recommend to USAID for support through the EPP, AEAI will consider the following criteria:

- Activities should reflect USAID and GOP priorities in responding to the energy sector crisis, as stated in the priority policy matrix.
- Activities must be complimentary to USG priorities.
- Activities must result in tangible positive benefits and be inclusive of all segments of society.
- Benefits must be achievable within the life of the project.

Activities will be developed and implemented to ensure outputs reflect international best practices but are tempered to fit the prevailing situation in Pakistan. This will facilitate achieving tangible, high impact results in a timely manner. It will also require pairing a range of international experts with local professional capability to ensure reform measures are pragmatic rather than dogmatic.

⁶ Currently the EPP is supporting the following line Ministries/entities: Ministries of Finance, Petroleum and Natural Resources, Planning Commission, NTDC.

COMPONENT THREE: NEW PROJECTS

For projects identified by the GOP and others as candidates for USG support, EPP undertakes a two-phase Due Diligence process, including:

Phase 1 identifies and analyzes candidate projects from existing documents, and presents the information in a manner that shows credibility and merit for more in-depth USG consideration for financial support. Phase I is based on existing information and does not involve origination of new analysis or site visits.

Phase 2 is a much more in-depth analysis of projects selected by using the outputs of Phase 1 and applying the above selection criteria. The focus of Phase 2 is to gather, analyze, and present additional information required for a definitive USG decision to support or not support a project, suggesting how much support USG should provide, and advising when, and by which mechanism, support should be provided. Due diligence is required to provide necessary information to senior USG policy and decision makers to select projects within the approved USAID Energy Strategy. EPP advised and assisted USAID with required due diligence and relevant documentation for all seven of the Signature Energy Projects announced by Secretary of State, Clinton.

USAID listed projects in the energy sector for EPP to investigate and review under its Due Diligence task. Phase 1 Due Diligence reports have been submitted for Diamer Basha Dam, Kurram Tangi Dam, Warsak Dam, and Mangla Dam. As follow-up, EPP periodically responds to USAID's requests for clarifications and additional information, as required. Major effort during the period was devoted to reviewing pre-project activities related to the Diamer Basha project. For Kurram Tangi Dam, USAID has authorized Phase 2 Due Diligence, which has since commenced. Given that irrigation is a major component of the project, the Phase 2 Due Diligence will be closely coordinated with USAID's Office of Agriculture. USAID and WAPDA have established a Joint Kurram Tangi Task Force to accelerate the pace of project development.

Activity under Component 3 regarding new potential projects for USAID funding focused largely on the Kurram Tangi Dam and Mangla Rehabilitation Projects. EPP answered several queries and provided information to assist the USAID Mission in resolving concerns raised by USAID Islamabad and the USAID Washington office. These related to the design of these projects, environmental assessment and mitigating measures, land acquisition, displaced person and resettlement plans, and related risks and issues.

As directed by USAID, EPP initiated a review of the progress and status of the Kurram Tangi Dam Project and a review of the environmental impact assessment (EIA). EPP also collected information on the rehabilitation study for the Mangla Power Station for Step II Due Diligence. A detailed briefing by the selected project consultants on Kurram Tangi Dam and Mangla Rehabilitation Projects was conducted in April 2012. EPP also held a number of meetings and shared design documents for the, Environmental Impact Assessment & Resettlement Action Plan Reports with Élan Partners, the USAID consultant selected for assessment of Kurram Tangi Dam and associated irrigation distribution system. EPP remained engaged in collecting information and updating the status of activities on the Diamer-Basha Dam Project and rehabilitation of Mangla Power Station.

USAID has selected the Mangla Upgrade and Kurram Tangi projects for possible funding. EPP submitted an illustrative budget to USAID for undertaking Step II Due Diligence⁷ for the two candidate projects. Following USAID's approval, EPP initiated work on Step II Due Diligence for the two projects. A series of meetings were held with WAPDA and related stakeholders for the Mangla and Kurram Tangi projects.

EPP focused on securing information, clarifying issues and verifying data to more accurately determine the status of the projects and to answer USAID queries and concerns. EPP provided advice to WAPDA managers on how to package the project and described information that would be required by USAID to facilitate the disbursement of funds for the Mangla and Kurram Tangi Projects.

EPP worked with WAPDA to break the above large projects as far as possible into distinct components to satisfy the time and funding constraints associated with USAID funding. WAPDA's proposal for the Mangla Upgrade project would take 10 years to complete, and the Kurram Tangi project would require \$700 million in funding. EPP worked with WAPDA to structure distinct components for both projects to meet the two key USAID objectives of disbursing the available level of funding and adding MW to the grid within the next couple of years, without compromising WAPDA's objectives. EPP also provided advice to WAPDA in developing documentation for the two projects to identify the specific goods and services proposed to be procured with USAID funds and their implementation and disbursement schedules.

Follow-up activities specific to each of these proposed projects includes the following:

MANGLA

EPP assisted USAID in finalizing the Initial Environmental Examination (IEE) Report of the Mangla Upgrade Project.

Discussions and meetings were held with WAPDA and their consultant Montgomery Watson Harza (MWH) to explain and discuss the Step II Due Diligence for the Mangla Upgrade projects. EPP explained the requirements of USAID with reference to the procurement and implementation plans for the Mangla Upgrade Project. The procurement documents are being prepared by MWH/WAPDA and EPP will provide support and guidance needed in the process.

The Mangla Upgrade Project is budgeted at \$397 million, divided now into three parts:

- Part One addresses units 5 and 6, common services and balance of plant works.
- Part Two applies to units 1 to 4 and the switchyard.
- Part Three applies to units 7 to 10.

⁷ Due diligence of USAID identified projects is carried out to reduce USG risks and develop project implementation agreements. Due diligence is carried out in 2 steps. Step I focuses on gathering and analyzing existing project documents to develop a basic understanding of the project and its status, including cost estimates and schedules. Step I serves as a basis for a tentative USG decision to support or not support the respective project. Step II involves gathering and analysis of additional information regarding a project, including validation of cost estimates from Step I. It recommends the type and level of USG support, identifies when the support is required and recommends the mechanism through which the support should be provided.

In keeping with USAID guidance on possible level of funds currently available, the expected cost of Part One is about \$150 million and completion date is early 2017. Project completion of Part Three, is expected by early 2023. In consultation with WAPDA project consultants, MWH, and with USAID's approval, a funding plan for Part One was proposed. It would be structured with appropriate payments in advance to principal suppliers against requisite guarantees, to reduce project costs and ensure completion on time and within budget.

EPP has provided guidance to WAPDA to prepare a matrix⁸ showing implementation schedule and funds required for Part One as a separate document for USAID consideration. The information was expected before end September but receipt is still pending. EPP continues to work with WAPDA to finalize their submission

KURRAM TANGI

The \$700 million project has been divided into three parts to accommodate and facilitate up to about \$100 million expected USAID funding:

- Part One is the Kaitu Weir plant and related structures,
- Part Two is the main dam and related structures, and
- Part Three is construction of new canals and existing canal rehabilitation.

EPP identified various issues related to the construction of Kaitu Weir and related structures. The most critical issue was the lack of credible information on hydrology of the Kaitu River. This is a key requirement and justification for the investment and construction of these facilities, specifically for power house No 4 located on the tunnel fed by the Kaitu Weir. EPP had requested WAPDA to provide more complete information on Kaitu Weir and related works in July and since then WAPDA consultants for the project – Mott MacDonald (MMP) – have provided detailed information and data and modified the text of their report to satisfy EPP observations.

EPP had meetings with senior WAPDA officials and their consultant, MMP, to seek an update on project progress and to discuss issues pertaining to potential funding of the project by USAID. Participants from WAPDA included General Manager (Planning & Development), General Manager (North), Member Water, General Manager (Hydel) Operations, and General Manager (Hydel) Development.

The over-riding issue is lack of security, which denies access to the site and makes it impossible to gain credible information. USAID is planning to task an environmental study of the project; however, the volatile security situation in North Waziristan Agency (NWA) has prevented the study from being commissioned at this time. Keeping in mind the limitations on access to sites for parts one and two of the project, and the need to quickly start work on part one, waivers to USAID requirement for a complete environmental reports may be required. WAPDA and USAID will be in a better position to resolve the issue when funding decisions are made and implementation agreement is finalized.

⁸ The schedules and budgets with explanatory and back up documentation prepared by WAPDA for the PC I encompass the entire project and it is not possible to isolate and clearly identify the works proposed to be funded by USAID.

EPP also held a meeting at the FATA Secretariat, Peshawar with the Secretary Law and Order (Security), Secretary Planning and Development and the Political Agent (PA) North Waziristan Agency to gather information needed as part of ongoing Step II Due Diligence for the Kurram Tangi Project.

ADDITIONAL PROPOSED PROJECTS

During the reporting period, upon USAID’s request, a technical and financial evaluation and assessment was conducted for several proposed projects. The list of projects under investigation and review during the period includes:

No.	Project	Cost
1.	84MW Kurram Tangi	expected to cost around \$700 million
2	18.9MW Kaitu Weir	expected to cost around \$93 million
3.	Rehabilitation of 1,000MW Mangla	expected to cost around \$400 million
4.	96MW Jinnah	\$225 Million project, WAPDA has requested \$20 million from USAID
5.	121MW Alai Khwar	\$208 Million project, WAPDA has requested \$17 Million from USAID
6.	72MW Khan Khwar	\$600 Million, WAPDA has requested \$28.5 million from USAID
7.	130MW Duber Khwar	\$290 million project, WAPDA has requested \$24 million from USAID
8.	106MW Golan Gol	\$268 million project needs \$107 million

On USAID’s request, WAPDA submitted a proposal for funding of Kaitu Weir Dam Project and affiliated works as a stand-alone area development initiative costing about \$93 million. This is a portion of the much larger \$700 million Kurram Tangi Dam project. During the reporting period, EPP submitted a brief review and evaluation and budget on Kaitu Weir to USAID for consideration, estimating that the proposed project could cost up to \$93 million. The review highlighted that, if undertaken, the project would improve 60km of roads and bridges, and create capacity to produce 18.9MW of hydroelectric power and irrigate 16,380 acres of land in the FATA.

Upon USAID’s request, EPP compiled and shared key information and details related to five hydropower projects being undertaken by WAPDA. Although these projects are nearing completion, additional funding support would allow for an expedited completion. These projects would provide an opportunity for USAID to grant about \$100 million and add more than 500MW to the grid.

COORDINATION & GENERAL SUPPORT SERVICES TO USAID

During the reporting period, EPP provided coordination and general support services to USAID to ensure smooth implementation of project activities, including:

- EPP prepared a draft speech and presentation for the USAID Energy Office for the National Energy Conference held in Lahore, April 9, 2012.
- Participated in a workshop held on ‘Gender Equity and Women’s Empowerment’ at the US Embassy.

- Provided support to USAID in compiling event briefings for visits to Gomal Zam and Satpara Dams in May. However, the visits were postponed by USAID due to unforeseen circumstances.
- In collaboration with PDP, submitted a document to USAID on “Short-Term Solutions to Mitigate Energy Crisis”. Rounds of meetings were conducted between USAID, EPP and PDP and discussions held on possible “quick impact” solutions.
- EPP conducted various meetings with the World Bank (WB) and Asian Development Bank (ADB) to coordinate efforts to ensure maximum impact and avoid duplication of efforts in the energy sector.
- Facilitated USAID in developing a matrix for a Transmission Efficiency Improvement Program (TEIP). The matrix summarized potential transmission projects, action items, impact and information about the work of other donors in the transmission area.
- EPP continued its support to USAID in its efforts to determine funding levels and schedules for new projects. In addition to projects being developed with WAPDA, on USAID’s request, EPP secured a list of twenty six dam and hydropower candidate projects in AJK and shared the list with USAID.
- Coordinated with project team members in the preparation of a results framework for a Performance Monitoring Plan (PMP) for the USAID Energy Office. Gave a presentation on EPP’s PMP to the USAID team. EPP held meetings with USAID and discussed the Results Framework of the Performance Management Plan for the USAID Pakistan Energy Portfolio. In collaboration with the USAID Power Distribution Program, the strategic objectives and performance indicators were defined and agreed upon, and a Performance Indicator Reference Sheet (PIRS) was developed, and submitted to USAID for review.

DEGREE TO WHICH TARGETS WERE MET AND RESULTS ACHIEVED

EPP provided technical assistance and advice and performed due diligence on a number of projects identified as candidates to receive USAID support. This includes submitting a due diligence report to USAID and making recommendations for additional review of the technical design and environmental review of potential projects. EPP also provided support for the procurement, finance and bidding processes for these projects. In addition, EPP prepared policy papers and provided technical assistance and support on issues to address the current energy crisis in Pakistan, improve sector performance and governance and to develop longer-term policies and solutions. EPP works with USAID and the GOP to identify and assess the viability of projects and activities that fit into, and help achieve the goals of, the USAID energy sector program and that will improve both the short-term and long-term viability of the Pakistan energy sector. Review of proposed projects is ongoing to determine their acceptability as USAID-funded projects. Technical assistance and advice to the GOP implementing partners to support policy reform and to improve energy sector performance and governance also is ongoing and is designed to provide a basis for sustainable improvement in the sector.

Confidential information redacted

Confidential information redacted

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