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USAID ENERGY POLICY PROGRAM

MONTHLY PROGRESS REPORT

March 2015



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USAID ENERGY POLICY PROGRAM

MONTHLY PROGRESS REPORT March 2015

Contract No: AID-EPP-I-00-03-00004

Order No: AID-391-TO-12-00002

Submission Date: April 5, 2015

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CONTENTS

Acronyms.....	iii
Executive Summary	1
Component 1: Project Monitoring and Implementation.....	3
Rehabilitation of Tarbela Hydropower Plant.....	4
Satpara Multipurpose Dam Completion Project (Project Completed).....	4
Muzaffargarh Thermal Power Station Rehabilitation Project.....	Error! Bookmark not defined.
Jamshoro Thermal Power Station Rehabilitation Project	Error! Bookmark not defined.
Mangla Dam Rehabilitation Project	Error! Bookmark not defined.
Improved Efficiency of Thermal Power Plants.....	Error! Bookmark not defined.
Component 2: Policy and Reform.....	6
Support to Ministry of Water and Power	6
Support to National Transmission and Despatch Company.....	6
Support to Ministry of Planning and Development	6
Support to Ministry of Finance.....	6
Support to Ministry of Petroleum and Natural Resources.....	7
Component 3: New Projects, Planning, and Development.....	10
Kurram Tangi/Kaitu Weir Project.....	10
Golen Gol Project.....	10
Other Projects	10
Component 4: New Activities.....	10
Peshawar Electric Supply Company	12
National Transmission and Despatch Centre.....	12
Live-Line Maintenance	12
Program Support Activities.....	14
Communications.....	Error! Bookmark not defined.
Capacity Building.....	Error! Bookmark not defined.
Gender Activities.....	Error! Bookmark not defined.
Monitoring and Evaluation.....	Error! Bookmark not defined.
Administration and finance.....	15
Procurement and Purchase Orders	16
Progress in Numbers	17
Annex I: success story – PowerSIM Aids Pakistan’s Power Sector.....	20
Annex II: Success Story – Enhancing Reliability of PESCO’s Power Network.....	21
Annex III: List of Key Meetings.....	22

TABLES

Table 1: Results Achieved through G2G Projects.....	3
Table 2: Accruals.....	15
Table 3: Purchase Orders Issued During February 2015.....	Error! Bookmark not defined.
Table 4: EPP Indicators and Achievement for February 2015	17
Table 5: EPP Indicators by Component February 2015	18
Annex Table 6: List of Key Meetings Conducted in February 2015	22

ACRONYMS

AEAI	Advanced Engineering Associates International, Inc.
CFW	Corporate Finance Wing
CPPA	Central Power Purchasing Authority
DGPC	Director General Petroleum Concessions
DISCO	Distribution Company
EETPL	Elengy Terminal Pakistan, Ltd.
EPP	Energy Policy Program
FGE	Facts Global Energy
FSRU	Floating Storage and Regasification Unit
G2G	Government-to-Government
GENCO	Generation Company
GOP	Government of Pakistan
GSC	Grid Systems Construction
GSO	Grid Systems Operation
ISGS	Interstate Gas System
JPCL	Jamshoro Power Company Limited
kV	Kilovolts
LEAP	Long-Range Energy Alternatives Planning System
LNG	Liquefied Natural Gas
LSA	LNG Services Agreement
MPNR	Ministry of Petroleum and Natural Resources
MW	Megawatt
MWP	Ministry of Water and Power
NEPRA	National Electric Power Regulatory Authority
NPCC	National Power Control Center
NPCL	Northern Power Generation Company Limited
NTDC	National Transmission and Dispatch Company
PESCO	Peshawar Electricity Supply Company
PIL	Project Implementation Letter
PowerSIM	Power Sector Integrated Model
PPA	Power Purchase Agreement
PQA	Port Qasim Authority
PSO	Pakistan State Oil Company
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority
WFW	Watson Farley & Williams

EXECUTIVE SUMMARY

COMPONENT I: PROJECT MONITORING AND IMPLEMENTATION

As of March, 2015, \$152.19 million has been disbursed to Government of Pakistan (GOP) implementing partners, and 1013 MW have been added to Pakistan's national grid. Results achieved through the successful monitoring and implementation of government to government (G2G) projects are illustrated in **Table I** below:

Table I: Results Achieved through G2G Projects

Projects	USG Funding (\$ Million)	Paid (\$ Million)	Completion Date	MW Gains/Benefits	
				Target	Achieved (Mar. 31, 2015)
Tarbela (Phase I)	16.50	14.25	12/31/15	128.0 MW	128.0 MW
Jamshoro	19.32	19.32	7/31/15	150.0 MW	270.0 MW
Guddu	19.12	18.91	7/31/15	75.0 MW	80.0 MW
Muzaffargarh	15.77	15.71	7/31/15	475.0 MW	500.0 MW
Gomal Zam	45.00	45.00	Complete	17.4 MW	17.4 MW
Satpara	26.00	26.00	Complete	17.6 MW	17.6 MW
Mangla	150.00	13.00	12/31/17	90 MW	In progress
Tarbela (Phase II)	25.00	Signing of PIL is in Progress	12/31/16	20 MW	In progress
Total	316.71	152.19		973 MW	1013 MW

REHABILITATION OF TARBELA HYDROPOWER PLANT

Phase-I. EPP visited WAPDA house Lahore to expedite the procurement and installation of remaining equipment's and advised WAPDA to agree a fast-track schedule with vendor to procure rotor poles by Dec 2015. EPP also supported WAPDA in processing a tax exemption request for "SCADA system" to expedite its delivery at Tarbela. The SCADA system will help in the better operation and sustainability of the power plant. Subsequent to the site visit of EPP environmental expert, an Environmental Monitoring and Audit report was submitted to USAID to ensure the implementation of EMMP at Tarbela.

Phase-II. EPP visited WAPDA house Lahore on March 13, 2015 and advised WAPDA to expedite the opening of assignment account in order to meet the conditions precedents set forth in the signed Activity Agreement as these are necessary before any disbursement.

EPP also provided USAID the revised payment schedule of Tarbela Phase II to finalize the Project Implementation Letter (PIL); the project will add 20MW and also increase the reliability and sustainability of the power plant.

MANGLA DAM REHABILITATION PROJECT

EPP provided USAID the updated procurement status of major equipment 'turbines and generators for Unit 5 and 6' and also advised WAPDA to agree a fast track schedule with vendor to complete the project by Dec 2017. The project will add 90 megawatts to the national grid through the refurbishment and up-gradation of units 5 and 6 of the power plant.

SATPARA MULTIPURPOSE DAM COMPLETION PROJECT (PROJECT COMPLETED)

EPP provided support to USAID/ENR on responding the quires of Satpara Audit. The audit is being conducted by Office of Inspector General (OIG).

MUZAFFARGARH THERMAL POWER STATION (MTPS) REHABILITATION PROJECT

EPP provided support in getting the amendment signed from Muzaffargarh. The amendment extends the project till Jul 2015 to complete the installation of the remaining items. After the signing of the amendment, EPP certify Muzaffargarh claim of \$404,700 against item#35: Up-Gradation/Rehabilitation of Turbine Auto Governing System, Digital Electro Hydraulic DEH-III & Data Acquisition System DAS-100 and Boiler & Turbine Auto Regulation Systems YEWPACK-II with Distributed Control System (DCS) Including all related Field Equipment on Study, Supply, Installation, Commissioning & Testing basis and forward it to USAID for reimbursement. This item is critical for the sustainability of the power plant operations. EPP also provided support to USAID on responding the quires regarding "Fuel oil additive", which was procured and utilized at Jamshoro and Muzaffargarh.



Muzaffargarh Thermal Power Station

EPP facilitated USAID in visiting the Muzaffargarh thermal power station to see the works completed at power plant. The visit was also critical to expedite the installation of the remaining items.

Jamshoro Thermal Power Station (JTPS) Rehabilitation Project

EPP provided support to USAID during visit to Jamshoro power station to see the rehabilitation works completed at power plant through USAID support. Rehabilitation of Jamshoro has added 270 MW to the national grid.



Arrival of Director Energy USAID at Jamshoro Power Plant



Briefing by Chief Executive Officer of Jamshoro Power Plant

COMPONENT 2: POLICY AND REFORM

SUPPORT TO MINISTRY OF WATER AND POWER

During the month, EPP met with Additional Secretary and Joint Secretary, Policy (MWP) to discuss the on-going and proposed activities with the Ministry. In addition, an introductory meeting was held with Secretary Water and Power to provide an overview of the program. The major activities undertaken during the month are given below:

EPP is involved in the following activities:

JPCL Power Purchase Agreement. EPP continues to work closely with JPCL and MWP in development of the PPA to be signed between CPPA (G) and JPCL. Based on the request from MWP, EPP has prepared a revised PPA which would recognize the complete legal removal of CPPA from within NTDC. EPP team has hired a consultant working specifically with JPCL to determine precisely what is required by JPCL to operate and meet the conditions set forth in the PPA. During the next month, EPP will continue to work with stakeholders to finalize this document.

NPCL Power Purchase Agreement. During the month, EPP continued working closely with MWP in development of the PPA for NPCL. A draft has been shared with MWP and EPP will revise the PPA based on feedback from stakeholders.

Policy Analysis. MOWP had requested EPP to analyse the changes in cost of generation by switching fuels. Power SIM was used as the policy analysis tool in this task and is being used by GOP in scenario analysis of the power sector.

SUPPORT TO NATIONAL TRANSMISSION AND DESPATCH COMPANY

NTDC Transmission License. At the request of MWP, EPP worked on development of a draft license which would recognize the removal of CPPA from NTDC. EPP technical team is reviewing the document and will provide a final draft to MWP shortly.

NTDC Strategic Business Plan. EPP team continues to work closely with Senior Management at NTDC and the Board of NTDC to develop the Strategic Plan (SP) for NTDC. SP Meetings were held in the second week of March and EPP concluded the discussion on SP initiatives with the group. In addition, EPP prepared a feedback form which was handed to participants to assist EPP staff in the development of the SP process, including the expected outcome, meeting format and content and the participant's recommendations for future meetings. The feedback and discussions over the month were extremely positive and will continue in the upcoming month.

In addition, EPP continued to hold meetings with individual departments during the month to finalize the draft SP which will be presented to NTDC Board Planning Committee in April.

Support to Ministry of Planning and Development

EPP continued to provide advisory support to the Energy Wing throughout the month on a variety of tasks as requested by Member and Secretary.

Implementation of E-Governance. EPP continued to work with the Energy Wing on the implementation process for the E-Office system. During the month, EPP seconded staff initiated assessment of Local Area Network (LAN) at Energy Wing with support from technical staff. The provision of network connection will be provided to all computer systems/officials at Energy Wing as

a primary step for implementation of E-Governance. EPP continued working with National Telecommunication Corporation (NTC) and Ministry of IT for Fibre connectivity.

NTC was requested to provide an update on the status of this connectivity and provide the financial requirements for execution of this project. The Ministry of IT has confirmed availability of funds for this project and EPP will assist in the implementation process. During the month EPP also provided technical assistance, system and network administration to the office of Member Energy.

Energy Plan 2013-18. EPP continued extending support to the Energy Wing on development of the 11th Five Year Energy Plan EPP's major contribution is through Power SIM and through recommendations to the Energy Wing staff to improve logic, consistency and flow. The plan has been finalized and forwarded to the Chief Economist, Planning Commission to be included in the Five Year Economic Plan (2013-18).

LEAP. EPP continued developing the energy reference system of Pakistan's power sector in LEAP. The database is in development phase and once complete, the model will serve as a tool for energy analysis and long term planning

Policy Analysis and Planning. EPP assisted Member Energy in preparing a presentation on Emerging Energy Scenario: Issues and Challenges. In addition, EPP provided support to the PC in organizing a round-table conference on Geographical Information System (GIS). The Conference will include participation from various public and private sector entities. EPP also provided policy support by updating the Power Supply Demand scenario and shortfall in the NTDC system based on daily data received from NPCC.

SUPPORT TO MINISTRY OF FINANCE

- Professional support was provided to Ministry of Finance, Corporate Finance Wing in finalizing their views/ comments on the draft Power Generation Policy 2015 submitted by Ministry of Water and Power to be considered by CCI.
- Assistance was provided to Corporate Finance Wing, Ministry of Finance in preparation of their statement to be filed before Lahore High Court in the cases relating to “**Surcharges**” imposed by the government under section 31(5) of NEPRA Act.
- Assistance was provided to Corporate Finance Wing, Ministry of Finance in preparation of their views/ comments on a proposal submitted by Ministry of Petroleum and Natural Resources regarding amendment in Pakistan Petroleum Production Rules, 1949, enabling Ministry of Petroleum and Natural Resources to grant extension in the existing leases.
- The draft report regarding Diagnostic Analysis/Review of Regulatory Framework of NEPRA was discussed in a meeting chaired by Director General, Economic Reforms Unit, Ministry of Finance, which was also attended by members NEPRA from KPK and Punjab. In this meeting it was decided that further deliberations would be required with NEPRA, before the report is finalized.
- Assistance was provided to Corporate Finance Wing, Ministry of Finance in preparation of their views/ comments on the draft Energy Purchase Agreement (EPA) and draft Implementation Agreement (IA) for Biomass Base Projects on IPP mode, submitted by Ministry of Water and Power, which will be approved by the ECC of the Cabinet.
- Assistance was provided to Corporate Finance Wing, Ministry of Finance in preparation of a brief for Secretary Finance regarding Power Generation Policy 2015 which was considered by the ECC in its meeting held on 18th March, 2015.

SUPPORT TO MINISTRY OF PETROLEUM AND NATURAL RESOURCES

Liquefied Natural Gas Imports

Liquefied Natural Gas Procurement.

- Watson Farley & Williams (WFW) and Facts Global Energy (FGE) continued providing support to the GOP team for concluding LNG SPA with Qatargas during the month. This included assisting the GOP team in LNG SPA negotiations with Qatargas in Doha from March 11-12 and support provided in Islamabad from March 13-27 for drafting LNG SPA with Qatargas. Another round of negotiations is expected to begin on April 1 in Doha.
- Work on finalizing various Direct and Option Agreements under the LSA Conditions Subsequent continued during the month. The following agreements have now been signed and executed:
 1. FSRU Option Agreement
 2. Fixed Assets Option Agreement
 3. EVTL Support Services Direct Agreement
 4. FSRU Charter Direct Agreement
- FGE gave presentations to the GOP LNG Price Negotiations Committee on 10th (via Skype) and 20th March in Islamabad.
- WFW and FGE also supported the GOP team in finalizing modalities for arranging the commissioning cargo for the LNG Terminal. Confirmation Notice for procuring the commissioning cargo was signed by PSO with Qatargas on March 18.
- WFW is supporting GOP in the tri-partite agreement among PSO, SSGCL and SNGPL.

Support to Port Qasim Authority.

- Regular project monitoring by civil marine, pipeline, environmental and navigational experts continued during the month.
- Full Mission Bridge Simulation (FMBS) study concluded at Siptort21 facilities in Madrid, Spain. A detailed report on the simulation results of bringing in Q-Flex and other smaller vessels to EETPL LNG Terminal at PQA was submitted by Siptort21. The report has been forwarded to PQA for review and consideration.
- ECIL-Granada team continued its assistance to PQA in closing the items pertaining to PQA on the Action Items Register prepared by Qatargas containing a matrix of ninety two port-related items needing resolution by the stakeholders. A response was also drafted to the letter sent by Qatargas pertaining to the open items post due diligence meetings held in March.
- ECIL-Granada team reviewed the Equipment Tests and Acceptance Tests Protocol under the LSA and submitted its comments which were forwarded to SSGC.
- ECIL-Granada developed the LNG Port Regulations and Port Tariff for LNG vessels calling at PQA which was submitted to PQA.
- EPP LNG Advisor and ECIL-Granada team held a series of meetings with EETPL to review issues arising out of various gap studies conducted for LNG terminal design and quality.

Shale Gas

- A series of review meetings were held with LMKR/KMR to review the progress of testing and evaluation work under Milestone-4A. LMKR indicated that testing of samples was in progress which would be followed by petro-physical analysis and mapping, report of which was likely to be completed by mid-April. EPP asked LMKR to finalize the report at the latest by 1st week of April. LMKR would discuss this with NuTech and revert.

- Work on Milestone-5 is in progress. KMR presented the features of the proposed financial model leading to determination of production cost for shale gas exploitation. Draft report is expected in 2 weeks.
- Technical evaluation of proposals submitted against the RFP for shale gas policy and regulatory framework formulation was completed and bidders were shortlisted.

Upstream Oil and Gas

- Advisory work on day to day issues of DGPC continued. Necessary advice was rendered on various regulatory, commercial and legal issues.
- Weekly progress review meetings with PTS were held throughout the month.
- The Onshore Model Supplemental Agreement was approved by the GOP and uploaded on the MPNR web site. Necessary action was initiated by EPP to undertake preliminary work to collect the relevant data from DGPC files related to the options exercised by E&P companies. Upon DGPC request, the concerned E&P companies started submission of draft Supplemental Agreements for consideration of the GOP. The documents received are under review for finalization.
- DGPC is yet to convene a meeting to discuss the Offshore Model Supplemental Agreement for conversion of policies.
- Several meetings were held with DGPC to discuss the draft SOPs related to the working of DGPC office for applications dealing with various regulatory requirements. Input of DGPC officers has been received and the modified SOPs are being prepared.
- PTS made a presentation to DGPC on the impact of 18th Constitutional Amendment regarding the ownership and regulation of petroleum rights between the federal and provincial governments. Comments of DGPC on the report are still awaited. Report will be finalized after incorporating comments by DGPC.
- Induction process of professionals in the Implementation Unit for DGPC was held during the month:
 - Request for Consent for hiring the selected Legal Expert has been sent to USAID for approval.
 - RFP for commercial expert was closed due to non-availability of suitable candidates.

COMPONENT 3: NEW PROJECTS, PLANNING, AND DEVELOPMENT

KURRAM TANGI/KAITU WEIR PROJECT

Major achievement this month for the Project in North Waziristan is that a bid has been received for construction of the Kaitu Weir, associated canals and works. After two failed efforts last year, primarily owing to the insecurity prevailing in the area, there has been progress this year in receipt of response to the third open advertisement soliciting contractors to bid for construction of the Kaitu Weir, Canals and Power House. A sole bid was received and has been opened as scheduled on 25 March 2015. It is a seemingly credible bid from consortium of Descon Engineering and FWO. The bid is to be evaluated by WAPDA consultants, Mott MacDonald. Result is expected soon and if accepted, there will be negotiations. If successful, work should start before July 2015.

Earlier, USAID and WAPDA met on 9 March 2015, at EPP to discuss the Project. WAPDA General Manager North and his Project Director for Kaitu Weir, supported by their Consultants from Mott MacDonald, briefed the Deputy Director, USAID/Peshawar Office, Program Director, USAID/Islamabad, USAID Mission (A) Environmental Officer, representative from USAID Finance Office and others from USAID, on activities, status and plans for the Project. Many issues were discussed, information deliverables identified and follow-on meeting set for Monday, 30 March 2015, post bid opening.

USAID is working with WAPDA to identify eligible costs of works and develop project construction schedules to draft a completion milestone and associated payment plan for the proposed \$81 Million indicated by USAID for the almost \$130 Million project. A \$40 Million loan from Italy is also under discussion at the Economic Affairs Division (EAD) of the GoP.

Drafts of various plans, schedules and possible payment by USAID against project activity completion stages continue to be discussed with WAPDA. When the schedules are finalized, the next step would be finalizing of an Activity Agreement for signature by USAID and WAPDA following which a Project Implementation Letter (PIL) will be agreed to fund the Project.

GOLEN GOL PROJECT

EPP sent its Due Diligence Report on Golan Gol Project to USAID and awaits response. However, EPP continues to monitor the project and notes that owing to winter snows there was not much activity at site lately. Meantime, WAPDA has sent a request to USAID for \$44.33 Million to fully fund cost of Civil Works and Equipment for the hydroelectric Power Plant. The Kuwait Fund has provided loan of \$37 Million for construction of the Power Plant but current estimate is that it will cost about \$80 Million.

The Saudi fund has provided loan of almost \$98 Million for all the civil works and structures at Intake and Tunnel, while the OPEC Fund is lending \$30 Million for Transmission Lines and Grid Stations.

The Project is expected to be completed in 2017 to provide 436 GWh of energy each year. Revenue from Golen Gol will be over \$33 million a year and the power will replace electricity production from thermal plants using imported fuel oil of about \$65 million per annum. The project will satiate electric power demand in Chitral, stimulate local businesses, provide job opportunities to locals, and stimulate cottage industry in the remote areas besides connecting Chitral to the national grid by a 300MVA, 132kV Transmission line, strengthening the existing 33KV transmission line connection that sends a mere 5MW to Chitral. The major construction has neither

displaced villagers nor adversely impacted the area. However till the Revised PCI is approved by Government and USAID involvement is approved, further delays and cost escalation can be expected.

COMPONENT 4: NEW ACTIVITIES

PESHAWAR ELECTRIC SUPPLY COMPANY

To date, 491.2 MW of transmission throughput capacity have been added to PESCO's network as a result of EPP's assistance.

Technical Audits. Audit reports are being compiled – 82 out of 82 reports have been compiled to-date. All substations have been audited. The reports highlight shortcomings/bottlenecks found and recommend preventive & corrective measures. Work is being done on final summary report.

Power Transformer Program. All (211) samples have been tested. The results show potential transformer damage. This damage increases the likelihood of an outage which can cause loss of customer loads. The results show that many of PESCO's transformers require oil purification. EPP is in the process of procuring two oil filtration plants for PESCO's operations and maintenance staff. EPP has asked PESCO to implement policy changes which will allow PESCO's GSO (Grid Systems Operation) staff to use the oil filtration plant of GSC (Grid Systems Construction) when it is not in use.

Tower Repair. The repair works at 13 of 13 (~98%) tower locations have been completed. Minor issues are being dealt by the contractor.

Transmission and Grid Equipment. PO has been awarded to M/s. Ikram Corporation for supply of T&G equipment. Some of the tools have already been delivered; the contractor is to deliver remaining equipment by end of April, 2015.

NATIONAL TRANSMISSION AND DESPATCH CENTRE

Technical Audits.

- To-date, 39 audit reports have been compiled. The reports propose steps necessary for carrying out both preventive and corrective maintenances and also recommend infrastructure upgrade/augmentation where necessary.
- 45 of 45 (100%) GS complete. All 39 technical audits of grid stations in the original scope of work have now been completed. The remaining 6 grid stations were recently commissioned and were added later, all of which have already been audited. Final reports of 39 GS have been compiled. A hardcopy of the report and a disk with all the backup data has been provided to the MD.
- Grid Station audited this month: DG Khan 500 kV and Toba Tek Singh 220 kV.

NTDC System Studies

Integration of intermittent renewable resources with national grid: the PO executed and work begun.

Real Time Digital Simulator. PO awarded to M/s. OPAL-RT. Owing to payment issues, the vendor hasn't started production works.

Auto Transformer Program

- PO awarded to M/s. JSHP for delivery of two 250MVA, 220/132kV Auto Transformers. Delivery is expected by end of April 2015.
- Fire Protection System: PO awarded to M/s. Xuming. Delivery expected by mid-April 2015.
- Circuit Breakers, conductor, connectors and other ancillaries are likely to be delivered by mid-May 2015.

Hardware and Software for NTDC Design

- Hardware for NTDC's Design Department: the vendor has delivered all the items.
- Software and Training for NTDC's Design Department: the procurement action is underway.

IT Hardware for NTDC IT

PO awarded this month. Delivery expected by April 2015.

Advisory Services to NPCC

- As a result of the recent blackouts, EPP experts, at the request of the NTDC BOD, are working at NPCC advising the General Manager on Grid Code compliance, Grid Code enforcement, and proper operations associated with that. The EPP experts are assisting through research and working with the dispatchers and managers.
- Concerning operations, load shed timing was changed to lessen its impact to the system, and AGC (Automatic Generation Control) was activated to help maintain frequency at 50 Hz. These are significant changes and are part of our contractual terms to provide the required assistance.
- EPP experts are working with NPCC authorities on integrating generating units with new SCADA system.
- There are lack of maintenance issues with lines and equipment that proper operation by NPCC will not be able to overcome.

LIVE-LINE MAINTENANCE

- Live Line refresher course for IESCO linemen started on March 9, 2015. The course and training sessions end on April 3, 2015.
- The live line training for twenty linemen from SEPCO and MEPCO started on February 2, 2015.

PROGRAM SUPPORT ACTIVITIES

CAPACITY BUILDING

NTDC Exchange. The EPP conducted a debriefing session for Market Operation exchange with Lahore participants on March 2. Participants formally shared their experience with the EPP, NTDC, and USAID regarding visits, action plan developments, and future plans. The final of the three exchange visits, Commercial Operation Exchange, started on March 22. Through these exchanges, EPP aims to improve transmission capacities in Pakistan's power sector while establishing professional relationships to draw upon after the conclusion of the program.

Live Line Maintenance. The EPP's Live Line Maintenance Batch II training for MEPCO and SEPCO is currently in process at NTDC Tarbela and anticipated to be completed in May. EPP started the first of the five refresher courses at IESCO on March 9. All Live Line Maintenance programs will be completed by October.

SAN Training. The second round of a focus group was conducted on March 4 at EPP's Lahore Office to monitor the progress made on the challenges highlighted by SAN training participants during its deployment at Central Power Purchasing Agency (CPPA). Participants highlighted the improvements made after the successful deployment and future goals. The discussion session was followed by a meeting with DG (I.T) for his feedback on the post - training outcomes and suggestions for further improvements.

LNG Business Management Certificate. EPP anticipates MPNR's nominations by the end of March. The program will host 15 participants in Kuala Lumpur in June. The program will focus on improving MPNR, ISGS, PQA, and PSO port and commercial capacity related to LNG import.

GENDER ACTIVITIES

Assessment and Strategy. EPP coordinated with USAID/Pakistan's gender specialist and the Energy Office's Assistant COR regarding the gender strategy and assessment. EPP will receive edits and from USAID and meet in-person in April for next steps prior to the planned public forum.

Increased Female Participation. EPP's final exchange visit program for NTDC is currently in process; 2 females and 7 males received visas and travelled to the US. The EPP currently has a 22% female participation rate across all training up from 4% in January 2014.

MONITORING & EVALUATION

Work Plan. USAID approved EPP's revised work plan for FY2015.

Confidential information redacted

Confidential information redacted

PROGRESS IN NUMBERS

Table 4 below provides the EPP indicators, targets, and achievements for March 2015. **Table 5** presents EPP Indicators by component for March 2015.

Table 3: EPP Indicators and Achievement for March 2015

Indicator	Unit	LOP Target	Achieved in March FY2015	Total Achieved as of March FY 2015	LOP % Achieved as of March FY2015
I.a: GWh of energy sold	GWh	7880	0	9,084	115%
I.1.a: Number of beneficiaries with improved energy services due to United States Government assistance	Individuals	13,624,226	0	15,668,784	115%
I.1.b: GWh of energy availability	GWh	7880	0	9,084	115%
I.1.c: MW available to meet power sector demand as a result of USG assistance	MW	1,303	0	1,504.2	115%
I.1.1.a: MW of electrical power added or saved as a result of USG improvements	MW	875	0	1,025.1	117%
I.1.1.b: Efficiency of thermal power plant tests completed	No.	3	0	2	67%
I.1.1.c: Number of USG supported installations and operations and maintenance improvements	No.	181	2	148	82%
I.1.1.d: Number of transmission bottlenecks resolved	No.	121	0	116	96%
I.1.4.a: Public and private funds leveraged by the USG for energy infrastructure projects	U.S. \$	193.5 million	0	38.5 Million	20%
I.2.1.a: Number of key policies and regulations in various stages	No.	12	7	26	217%
I.2.2.a: Number of policies following international best practices	No.	6	1	3	50%
I.2.2.b: Number of board recommendations following international best practices	No.	4	0	0	0%
I.2.3.a: Number of best practice-driven systems created, improved, and implemented	No.	10	1	6	60%
I.2.4.b: Number of public forums resulting from USG assistance in which government officials and citizens interact	No.	12	0	5	42%

Table 4: EPP Indicators by Component March 2015

Indicator	Unit	Component	LOP Target	Achieved in March FY2015	Total Achieved as of March FY 2015	LOP % Achieved as of March FY2015
I.I.a: Number of beneficiaries with improved energy services due to United States Government assistance	Individuals	Total	13,624,226	0	15,668,784	115%
		I-Generation	7,993,106	0	9,382,406	117%
		IV-Transmission Throughput Capacity	5,477,544	0	6,130,242	112%
		IV – Transmission Added/Saved	153,576	0	156,136	102%
I.I.b: GWh of energy availability	GWh	I & IV	7880	0	9,084	115%
		I-Generation	4,796	0	5,642.29	118%
		IV-Transmission Throughput Capacity	2999.4	0	3,356.83	112%
		IV – Transmission Added/Saved	84	0	85.49	102%
I.I.c: MW available to meet power sector demand as a result of USG assistance	MW	I & IV	1,303	0	1,504.1	115%
		I-Generation	863	0	1,013	117%
		IV-Transmission Throughput Capacity	428	0	479	112%
		IV – Transmission Added/Saved	12	0	12.2	102%
I.I.I.a: MW of electrical power added or saved as a result of USG improvements	MW	I & IV	875	0	1025.2	117%
		I-Generation	863	0	1,013	117%
		IV – Transmission Added/Saved	12	0	12.2	102%

ANNEXES

ANNEX I: SUCCESS STORY – PowerSIM AID PAKISTAN’S POWER SECTOR

There is a grave energy supply and delivery problem in Pakistan. Expensive natural gas has been declining as a fuel in power generation and imports have slowed. The impact on the power sector of natural gas availability is substantial but to date there has been no way to easily measure the financial impact.

The USAID Energy Policy Program (EPP) team developed a tool that would attend to these critical needs – the Power Sector Integrated Model, known as PowerSIM, which is a Microsoft Excel-based policy analysis tool. The main purpose of PowerSIM is to help the Government of Pakistan in evaluating policy options and measures aimed at improving the financial efficiency and sustainability of the country’s power sector. It is also being used to address a major problem regarding LNG, for instance, what happens if you allocate LNG to the power sector at different amounts and quantity? The Ministry of Water and Power has used it to demonstrate what happens to the power sector with additional gas supply as the tool allows policy makers to see how small changes impact the overall system such as consumer prices, circular debt, the cost of generation, and fuel use. Currently, EPP is using PowerSIM to develop the Planning Commission’s 11th 5-Year Plan to build financial and supply assumptions.

While developing PowerSIM, EPP carried out training sessions for senior officials and technical staff at the Ministry of Petroleum and Natural Resources and Ministry of Water and Power. A total of 11 participants, including one female official, attended the session.

“Currently, I am dealing with the affairs of finance at the Power Ministry. Through the PowerSIM, I can analyze data, information and statistics provided by NEPRA and other departments”, opines Muhammad Farhan, a Section Officer at the MWP.

PowerSIM is now being used by the Government of Pakistan to forecast the financial impact of improved performance within existing systems such as greater efficiency, power generation and infrastructure additions, fuel substitutions, improved cost recovery, and policy changes. It has facilitated the Ministry of Water and Power and Ministry of Petroleum and Natural Resources to better analyze both energy and cash flow and subsequently make informed decisions. It has further helped assess the impact of policy changes from uniform national tariffs to differential tariffs and the impact of timely fuel payments to Independent Power Producers.

Shabana Kifayat, an accountant at the Ministry of Power & Natural Resources (MNPR) says, “MNPR can use PowerSIM to determine the average gas cost. More importantly, it may determine how much sale prices of different sectors are to be increased and decreased to cover the average gas price/cost”.



Trainees from Ministry of Water and Power after successful completion of the PowerSIM Training



PowerSIM Model Presentation at Planning Commission

ANNEX II: SUCCESS STORY – ENHANCING RELIABILITY OF PESCO’S POWER NETWORK

Delivering reliable electric power to consumers depends to a large extent on the condition of the power plant’s equipment. One of the most critical components of a power system is its power transformers, and their proper functioning is fundamental for delivering power to the substations and utilities. Cooling fans increase the amount of power that a transformer can deliver, enhance its service life, and reduce losses by providing additional cooling of the transformer’s oil. The efficient cooling of power transformers is of paramount importance in the peak summer season when temperatures rise and loads increase.

The USAID Energy Policy Program (EPP) team has been working to improve and upgrade the transmission system of Peshawar Electric Supply Company (PESCO) to reduce transmission losses and improve reliability. As part of this effort, 477 cooling fans were installed on 104 power transformers at 69 of PESCO’s Grid Stations as of February 2015. The newly installed cooling fans and fan motor circuit breakers on the power transformer are helping to recapture 260.5 MWs of transmission throughput capacity on PESCO’s Grid and benefitting 3,333,879 individuals. EPP support to PESCO included coordinating inspection of the cooling fans by EPP’s engineers, attending factory acceptance tests, and conducting onsite inspections of each cooling fan installation. All installation work has been completed in the presence and satisfaction of EPP and PESCO representatives.

EPP is also working toward enhancing power transformer reliability by providing PESCO with transformer oil purification plants. Dirty oil in the transformers can potentially damage the transformers, which can lead to power outages and cause unscheduled load-shedding. Testing of oil quality showed that many of PESCO’s transformers required oil purification. EPP has initiated the procurement of two transformer oil purification plants along with the necessary oil testing equipment at the request of PESCO. The oil purification plants will assist PESCO in adopting efficient transformer maintenance practices and significantly enhance the useful life of the power transformers.

It is intended that the lessons learned at PESCO can be applied to other power distribution companies (DISCOs) in Pakistan to improve operations and increase the amount of power supplied to end-users.

The newly installed cooling fans and fan motor circuit breakers on the power transformer are helping to recapture 260.5 MWs of transmission throughput capacity on PESCO’s Grid and benefitting 3,333,879 individuals.



New cooling fans manufactured at Heavy Electrical Complex, Hattar



Newly installed cooling fans at Shahi Bagh grid station, Peshawar

ANNEX III: LIST OF KEY MEETINGS

Annex Table 5: List of Key Meetings Conducted in February 2015

Meeting with	Date	Location	Purpose	Outcome/Result
Component 1: Project Monitoring & Implementation				
CEO Jamshoro	Mar 1	Jamshoro Power Plant	To discuss the progress and also on the planning of USAID visit to power plant	<ol style="list-style-type: none"> 1. Jamshoro was advised to expedite the installation of remaining equipment 2. Jamshoro requested ministry to coordinate with Japanese embassy so that the Japanese experts will visit power plant and do the overhauling of unit 1. 3. USAID visited the power plant and see the completed works
USAID project Manager for thermal projects	Mar 11	EPP office	To discuss the progress of the remaining equipment in Jamshoro, muzaffargarh & Guddu.	<ol style="list-style-type: none"> 1. USAID conducted a visit to Muzaffargarh to expedite the installation of the remaining items.
Member Power WAPDA	March 13	WAPDA house Lahore	To discuss the progress on Tarbela Phase I & Phase II, and funding of Golen Gol	<ol style="list-style-type: none"> 1. WAPDA was advised to expedite the procurement of rotor poles under Tarbela phase –I, and opening of account for Tarbela phase-II. 2. WAPDA to agree a fast track schedule with vendor to complete the installation by Dec 2017. 3. WAPDA submitted a letter to show the areas in which USAID funding is required.
CEO Muzaffargarh, CE Tech Director Muzaffargarh	Mar 24	Muzaffargarh Thermal Power Station	To discuss the progress and also to finalize the plan of USAID visit to power station	<ol style="list-style-type: none"> 1. Muzaffargarh was advised to press the vendors to deliver the equipment's early so that the equipment will be installed by Jul 2015. 2. USAID project manager conducted visit to muzffargarh power station.
Component 2: Policy and Reform				

Meeting with	Date	Location	Purpose	Outcome/Result
Mr. Dilbar Ghouri (Company Secretary NTDC)	25 th , March 2015	NTDC Office Lahore	The Agenda for the meeting was to discuss the latest updated SP Draft	<ol style="list-style-type: none"> Next Planning committee meeting was scheduled. Approach to Circulating the SP to the board of directors for comments
NTDC Senior Management	12 th & 13 th , March 2015	Avari Hotel, Lahore	<p>The Agenda for the meeting was to:</p> <ol style="list-style-type: none"> Obtain feedback from participants Finalization of the initiatives Putting the SP document up for review 	<ol style="list-style-type: none"> The initiatives finalized from the last SP meeting were revisited. Few copies of the SP were circulated among the participants for their feedback on it. A feedback questionnaire was handed out to each participant for their feedback on overall SP process
Mr. Ghulam Murtaza, C.E-I (Settlement), CPPA and his staff	11 th March 2015	NTDC Office Lahore	Agenda of the meeting was to understand the CPPA's Settlement department's function.	Understood the functions of CPPA Settlement department in detail the payment process.
Mr. Waseem, Manager Finance NTDC	11 th March 2015	NTDC Office Lahore	To discuss the budgeting function of NTDC	Budgeting process was discussed in detail and the procurement plan was discussed.
Mr. Sabz Ali Khan, G.M, GSO	11 th March 2015	NTDC Office Lahore	To understand how the maintenance carried out and Maintenance plans.	Maintenance reports were reviewed and maintenance budgets were discussed and problems in carrying out the maintenance
Mr. Akhtar Ali (Member Energy Wing) and Mr. Hamid Balghari (Chief Energy Finance and Economics)	March 10, 11	Energy Wing Islamabad	The agenda of the meeting was to discuss improvements in the 5 year plan.	<ol style="list-style-type: none"> The agenda of the meeting was to discuss improvements in the 5 year plan.
Secretary Water and Power	March 16 th , 2015	MWP Islamabad	Introductory meeting to brief Secretary on Energy Policy Program	<ol style="list-style-type: none"> Discussion on key activities undertaken by EPP Follow-up meeting to be scheduled based with Secretary Water and Power
Mr. Rehan, G.M Planning, NTDC	26 th March, 2015	NTDC Office Lahore	To understand the planning function regarding the capital investment plan and obtaining latest generation plan and load forecast	The investment plans were discussed and obtained the generation plan and the Power Balances.
Mr Mohsin, Board Member, NTDC	26 th March, 2015	NTDC Office Lahore	Review and comments on the SP	The SP draft was discussed in detail. Obtained comments.

Meeting with	Date	Location	Purpose	Outcome/Result
Mr. Dilbar Ghouri (Company Secretary NTDC)	25 th , March 2015	NTDC Office Lahore	The Agenda for the meeting was to discuss the latest updated SP Draft	<ol style="list-style-type: none"> 5. Next Planning committee meeting was scheduled. 6. Approach to Circulating the SP to the board of directors for comments
EPP, EETPL	March 4, 2015	EETPL LNG Terminal, PQA.	Progress Update and site visit.	<ul style="list-style-type: none"> • CEO EETPL and his team gave a presentation on the project to EPP. EETPL raised concerns regarding delays by the GOP in confirming the Commissioning Cargo. • Site visit was conducted following the presentation.
EPP, PQA, ECIL- Granada	March 4, 2015	Chairman Secretariat, PQA Karachi.	Presentation by ECIL-Granada on current status of support to PQA, debriefing by PQA pilots on FMBS simulation study at Siport21.	<ul style="list-style-type: none"> • EPP would request EETPL to provide the quality assurance and other documents related to the terminal design/construction to EPP's consultants so that they could provide their report to PQA regarding vetting of the terminal. • Following a discussion between COP EPP AND CEO EETPL, a series of meetings were held among EETPL, EPP consultants and EPP during which EETPL provided the requisite documents to EPP consultants for review. • EPP provided support to PQA to draft a letter to MPNR regarding additional dredging and navigational instruments requirement.

Meeting with	Date	Location	Purpose	Outcome/Result
EPP, SSGC, ECIL-Granada	March 5, 2015	SSGC Head Office, Karachi.	Way forward for commissioning and Acceptance Tests Protocol.	<p>The following items were discussed:</p> <ul style="list-style-type: none"> • Assistance of EPP's LNG consultants for witnessing of Acceptance Tests and Terminal commissioning under LSA. • Role of inspection agency being appointed jointly by Qatar Gas, EETPL and SSGC for performance verification under Acceptance Test Protocols and commissioning tests. • Requirement of inspection of FSRU at Dry Dock and EETPL terminal after berthing. • LNG Consultants' review of the Operations Manual and Emergency Response Procedures submitted by EETPL to SSGC.
DGPC, World Bank, Ministry of Finance, PPEPCA, EPP	March 12, 2015	DGPC Office, Islamabad.	Status review in respect of execution of the Supplemental Agreement for policy conversions.	<ul style="list-style-type: none"> • World Bank desired to have a work plan by March 19, 2015 for execution of at least 120 Agreements. • DGPC was requested by World Bank to impress upon the companies to submit the draft Supplemental Agreements on an urgent basis so that the Implementation Unit could initiate the review of these documents.
USAID, U.S. Consulate Karachi, PQA, EPP	March 20, 2015	PQA Office, Karachi	Update on LNG project.	<ul style="list-style-type: none"> • PQA gave a briefing to the U.S. delegation on the EETPL LNG project as well as future LNG projects in planning stages at PQA.

Meeting with	Date	Location	Purpose	Outcome/Result
USAID, World Bank, EPP	March 24, 2015	EPP Office, Islamabad.	Status review in respect of execution of the Supplemental Agreement for policy conversions.	<ul style="list-style-type: none"> The meeting was requested by USAID Office of Energy to review the progress in execution of supplemental agreement by DGPC and E&P companies. EPP understands that execution of these agreements is a conditionality in a WB loan. USAID requested EPP to allocate all possible resources to give priority to the execution of the Supplemental Agreements and to coordinate with DGPC to impress upon the companies to submit the draft Supplemental Agreements on an urgent basis to enable EPP to initiate the review and execution of these documents. It was preferred that the Supplemental Agreements executed within a week's time constituted a mix of public and private companies. Preference should be given to the Agreements covering the production (discoveries). A follow-up meeting will be held to review the status.
EPP, EETPL	March 4, 2015	EETPL LNG Terminal, PQA.	Progress Update and site visit.	<ul style="list-style-type: none"> CEO EETPL and his team gave a presentation on the project to EPP. EETPL raised concerns regarding delays by the GOP in confirming the Commissioning Cargo. Site visit was conducted following the presentation.

Meeting with	Date	Location	Purpose	Outcome/Result
EPP, PQA, ECIL-Granada	March 4, 2015	Chairman Secretariat, PQA Karachi.	Presentation by ECIL-Granada on current status of support to PQA, debriefing by PQA pilots on FMBS simulation study at Sipoort21.	<ul style="list-style-type: none"> EPP would request EETPL to provide the quality assurance and other documents related to the terminal design/construction to EPP's consultants so that they could provide their report to PQA regarding vetting of the terminal. Following a discussion between COP EPP AND CEO EETPL, a series of meetings were held among EETPL, EPP consultants and EPP during which EETPL provided the requisite documents to EPP consultants for review. EPP provided support to PQA to draft a letter to MPNR regarding additional dredging and navigational instruments requirement.
DG(ERU)	11-03-2015	Ministry of Finance	To get the input of NEPRA on the draft report being prepared by ERU in pursuance of the directions of the CCI for Diagnostic Review of NEPRA.	NEPRA will send their views on the recommendation of the draft report which will be considered in the next meeting.

Component 4: New Activities

MD NTDC, GM NPCC	Mar 2, 2015	Islamabad	Discussed issues concerning operations and SCADA system	It was agreed that MD will look into it and name accountable parties.
JICA	Mar 13, 2015	Islamabad	To discuss various ongoing and upcoming EPP activities	Discussed generation mix, schedule for generation and getting information from planning.
GM NPCC	Mar 16, 2015	Islamabad	Shifting of traffic old SCADA system to new SCADA system	Some of the IPPs report data on old Siemens installed SCADA system. The old system doesn't meet modern day requirements and hence traffic is to be shifted on new SCADA system. EPP is assisting NPCC in doing that.
NTDC BOD, GM Telecom, GM NPCC, GM GSC	Mar 26, 2015	Lahore/Islamabad	To discuss status of SCADA system	NTDC committed to having SCADA system fully in service by end of 2015.

Program Support Activities

Meeting with	Date	Location	Purpose	Outcome/Result
Market Operation Exchange participants from NTDC - NPCC	February 25, 2015	EPP Office, Islamabad	Debriefing session for participants to share their experience with USAID and EPP regarding their exchange visit to the US.	<ul style="list-style-type: none"> EPP hosted a debriefing session to follow-up with the participants to formally share their experience with USAID and EPP regarding visits, action plan developments, and future plans.
Market Operation Exchange participants from NTDC	March 2, 2015	EPP Office, Lahore	Debriefing session for participants to share their experience with USAID and EPP regarding their exchange visit to the US.	<ul style="list-style-type: none"> EPP hosted a debriefing session to follow-up with the participants to formally share their experience with USAID and EPP regarding visits, action plan developments, and future plans.
Commercial Operations Exchange Participants	March 3, 2015	EPP Office, Lahore	DS-160 for Visa paper work for all the 9 participants of Commercial Operation exchange program started on March 22	<ul style="list-style-type: none"> 9 participants visited AEAI Lahore office to complete their DS-160 online Visa Interview Application form.
Storage Area Network Participants	March 4, 2015	EPP Office, Lahore	Focus Group Discussion with Storage Area Network participants	<ul style="list-style-type: none"> Second round of focus group discussions was conducted on March 4 at EPP's Lahore Office to monitor the progress made on the challenges highlighted by SAN training participants during its deployment at Central Power Purchasing Agency (CPPA). Participants highlighted the improvements made after the successful deployment.
Director General (I.T)	March 4, 2015	WAPDA House, Lahore	Post SAN deployment follow-up	<ul style="list-style-type: none"> EPP conducted a meeting with DG (I.T) for his feedback after the successful deployment of SAN at CPPA. EPP officials discuss the details about the SAN for future improvements.
USAID Gender Specialist	March 24, 2015	EPP Office, Islamabad	Discussion about the Gender Strategy and Assessment	<ul style="list-style-type: none"> EPP attended a conference call on March 24 at EPP Islamabad office with USAID gender specialist in Washington to discuss the gender strategy. EPP requested USAID to review with their gender specialist the next steps for the stakeholder forum.
Market Operation Exchange participants from NTDC - NPCC	February 25, 2015	EPP Office, Islamabad	Debriefing session for participants to share their experience with USAID and EPP regarding their exchange visit to the US.	<ul style="list-style-type: none"> EPP hosted a debriefing session to follow-up with the participants to formally share their experience with USAID and EPP regarding visits, action plan developments, and future plans.

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