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# USAID ENERGY POLICY PROGRAM

## MONTHLY PROGRESS REPORT

### November 2015



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### **DISCLAIMER**

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# ACRONYMS

AEAI	Advanced Engineering Associates International, Inc.
AEDB	Alternative Energy Development Board
CLM	Cornelius, Lane & Mufti
DGPC	Director General Petroleum Concessions
ECC	Economic Coordination Committee
EETL	Engro Elengy Terminal Limited
DISCO	Distribution Company
EMMP	Environmental Mitigation and Monitoring Plan
EPP	Energy Policy Program
ERP	Enterprise Resource Planning
FWO	Frontier Works Organization
G2G	Government-to-Government
GENCO	Generation Company
GIS	Geographical Information System
GOP	Government of Pakistan
IPP	Independent Power Producer
JPCL	Jamshoro Power Company Limited
LNG	Liquefied Natural Gas
MPNR	Ministry of Petroleum and Natural Resources
MSPA	Master Sales Purchase Agreement
MW	Megawatt
MWP	Ministry of Water and Power
NEPRA	National Electric Power Regulatory Authority
NTDC	National Transmission and Dispatch Company
OGRA	Oil and Gas Regulatory Authority
PESCO	Peshawar Electricity Supply Company
PIL	Project Implementation Letter
PPA	Power Purchase Agreement
PQA	Port Qasim Authority
PSO	Pakistan State Oil Company
RTPSS	Real Time Power System Simulator
SCADA	System Control and Data Acquisition
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority
WFW	Watson Farley & Williams

# EXECUTIVE SUMMARY

## MONITORING AND PROJECT IMPLEMENTATION SUPPORT

During this reporting period, the cumulative number of people who have directly benefited from the Energy Policy Program's (EPP's) efforts stands at 19.94 million or 11.1% of the population at the end of November 2015. EPP's efforts have improved the financial performance of energy sector entities by \$855 million. This represents approximately 9.8% of the 2012 circular debt. As of November 2015, \$153.49 million has been disbursed to the Government of Pakistan (GOP) implementing partners, and 1013 megawatts have been added to the national grid of Pakistan. Whereas, 915.2 megawatts of transmission throughput capacity have been added to the PESCO and NTDC networks.

Work continued steadfastly towards achieving the larger goal of the USAID EPP during the reporting period of November, thereby providing monitoring and implementation support for the on-going G2G Signature Energy Projects. EPP visited Tarbela Power Station to monitor the ongoing installation of SCADA system and advised WAPDA to expedite the installation so as to fully accomplish it by December 2015. This system will add to the sustainability of the power plant operations.

EPP team visited the Guddu Power Plant to monitor the installation of bypass dampers on GT-7 and 8 and inspected the new equipment while troubleshooting minor issues arising during the course of installation. Subsequently, a report in this regard was submitted to USAID. EPP provided support to USAID on calculating greenhouse gases (GHG) emission reduction at all the GENCOs. The reduction in GHG of about 1,294,174 tCO<sub>2</sub>e is made possible after the improvement in heat rates due to the rehab works. Moreover, WAPDA is advised to expedite the installation of SCADA system so as to complete the task by December 2015. This system will add to the sustainability of the power plant operations.

## POLICY AND REFORM

Work continued on power sector agreements emanating from the ongoing power sector reforms. Based on the ongoing consultation with MWP, PPA of May 2015 was revised wherein some editorial improvements and some valid suggestions of JPCL were incorporated. The latest PPA was submitted and duly acknowledged by MWP.

Moreover, comments on the five-year tender documents and related Master Sales Purchase Agreement (MSPA) as well as the confirmation notice were provided to Pakistan State Oil. Joint review of the response prepared by the consultant regarding observations of Shell International's audit report on LNG operational and navigational aspects was carried out with the PQA and the finalized version was subsequently forwarded to EETPL.

Milestone-6 report and Shale Gas/Oil Guidance document including the regulatory and legal aspects were discussed with the consultants and are currently being finalized by LMKR/KMR. During the reporting period, assistance was provided to the Corporate Finance Wing in negotiating the loan for the Dasu Power Project through local bank consortium, which will be obtained on the basis of WAPDA's own balance sheet.

## NEW PROJECTS, PLANNING, AND DEVELOPMENT

GOPA consulting company conducted the study for permitted capacity induction in the national grid. The model handover workshop in this regard was conducted on November 25-26 wherein the methodology adopted by consultants was discussed and the actual model used for analysis was run. The simulation results look promising and the stakeholders felt satisfied with the study outcomes.

Additionally, four of the eight Electrical Testing Equipment shipments were delivered to NTDC. The exemption for two shipments was granted and their clearance is awaited. For the remaining two shipments, exemption is expected by December 04, 2015.

The fourth spare unit 150MVA damaged power transformer at Sheikh Muhammadi grid station was repaired by EPP. The 500/220kV 150MVA transformer's winding has been put back, oil filled while the oil dehydration is in progress. Factory Acceptance Test (FAT) is underway and expected to be completed by December 10.

Installation of the second 250 MVA transformer (replacing the existing 160 MVA auto transformer) at the 220kV Mardan GS started from October 27 2015. It was energized on November 28, 2015 and put on load on November 30, 2015. The transformer has helped enhance NTDC's throughput capacity by 90 MVA. The installation of first 160 MVA transformer at 220kV Nishatabad GS has also been completed, which has helped enhance NTDC's throughput capacity by 160 MVA.

# COMPONENT I: PROJECT MONITORING AND IMPLEMENTATION

EPP continued providing monitoring and implementation support for the seven G2G Signature Energy Projects. The Tarbela power station was visited to monitor ongoing installation of the SCADA system. WAPDA was advised to expedite the installation to complete it by Dec 2015. The SCADA system will add to the sustainability of the power plant operations. USAID was facilitated in drafting the Amendment of Activity Agreement and Action Memorandum for Tarbela Phase-I to extend the completion date to complete the procurement of remaining equipment—Rotor Poles. These rotor poles will ensure sustainability of the already achieved 128 MW and operations of the rehabilitated units.

The installation of bypass dampers on GT-7 & 8 at the Guddu power plant installation was monitored by EPP experts, due to an unforeseen incident, whereby the Guddu management was unable to install it. EPP inspected the new equipment and analyzed the problem that emerged during installation, while a report to this effect was submitted to USAID.

A visit by the USAID officials to the Muzaffargarh thermal power station was facilitated in terms of organizing the media event. Senior officials of USAID inaugurated the rehabilitation at Muzaffargarh thermal power station alongside Chief Minister Punjab and his entourage. Rehabilitation of the power station was resulted in the restoration of 500 MW to the national grid, thereby benefitting 4.63 million people.

EPP provided support to USAID in response to the OIG queries regarding Gomal Zam dam and the power station. The Gomal Zam Dam project was completed in September 2013 and has generated about 79.9 million kWh of electricity ever since.

EPP provided support to USAID on calculating the greenhouse gases (GHG) emission reduction at all the GENCOs. The reduction in GHG of about 1,294,174 tCO<sub>2</sub>e is made possible after the improvement in heat rates due to the rehabilitation works. Table I below summarizes the results achieved through G2G projects in November 2015.

**Table I: Results Achieved through G2G Projects**

Projects	USG Funding (\$ Million)	Disbursed (\$ Million)	Completion Date	MW GAINS/BENEFITS	
				Target	Achieved Nov 30, 2015
Tarbela (Phase I)	16.50	15.55	12/31/15*	128.0 MW	128.0 MW
Jamshoro	19.32	19.32	6/30/16	150.0 MW	270.0 MW
Guddu	19.12	18.91	12/31/15	75.0 MW	80.0 MW
Muzaffargarh	15.77	15.71	3/31/16	475.0 MW	500.0 MW
Gomal Zam	45.00	45.00	Completed	17.4 MW	17.4 MW
Satpara	26.00	26.00	Completed	17.6 MW	17.6 MW
Mangla	150.00	13.00	12/31/17	90 MW	In progress
Tarbela (Phase II)	25.00	PIL Signed	12/31/17	20 MW	In progress
<b>Total</b>	<b>316.71</b>	<b>153.49</b>		<b>973 MW</b>	<b>1013 MW</b>

\*WAPDA/Tarbela submitted a time extension request to USAID

## REHABILITATION OF TARBELA HYDROPOWER PLANT

Experts of EPP visited Tarbela power station to monitor ongoing installation of SCADA system and also advised WAPDA to expedite the installation to complete it by December 2015. The SCADA system will add to the sustainability of the power plant operations. EPP facilitated USAID in drafting the Amendment of Activity Agreement and Action Memorandum for Tarbela Phase-I to extend the completion date to complete the procurement of the remaining equipment “Rotor Poles. The rotor poles will ensure sustainability of already achieved 128 MW and operations of the rehabilitated units.



## GOMAL ZAM DAM PROJECT

EPP provided support to USAID in responding to the OIG queries regarding the dam and power station. The project was already completed in September 2013 and has generated about 79.9 million kWh of electricity.

## GUDDU THERMAL POWER STATION REHABILITATION PROJECT

EPP visited the Guddu power plant to monitor the installation of bypass dampers on GT-7 & 8 but due to an unforeseen incident, the Guddu management was unable to install the same. EPP inspected the new equipment and analyzed the emergent problem during installation. Subsequently, EPP submitted a report to USAID. EPP also provided support to USAID on calculating the greenhouse gases (GHG) emission reduction at Guddu. The reduction in GHG of about 547,693 tCO<sub>2</sub>e is made possible after the improvement in heat rates due to the rehab works at GT-7 & GT-8 of Guddu.



## MUZAFFARGARH THERMAL POWER STATION REHABILITATION PROJECT

EPP facilitated USAID to inaugurate the rehabilitated Muzaffargarh thermal power station. USAID Mission Director, and Chief Minister Punjab, inaugurated the rehabilitated Power Station. USAID Director Energy Office, Consul General Lahore, and other senior USAID and GOP officials also visited the power station. The rehabilitation has resulted in the restoration of 500 MW to the national grid, thereby benefitting 4.63 million people.

EPP also provided support to USAID on calculating the greenhouse gases (GHG) emission reduction at Muzaffargarh. The reduction in GHG of about 365,332 tCO<sub>2</sub>e is made possible after the improvement in heat rates due to the rehabilitation works.



US Consul General Lahore, Chief of Party USAID Energy Policy Program, CEO Muzaffargarh Thermal Power Station, USAID Mission Director and Director Energy Office USAID, Ross Hagen receives the Chief Minister Punjab, Mian Muhammad Shehbaz Sharif



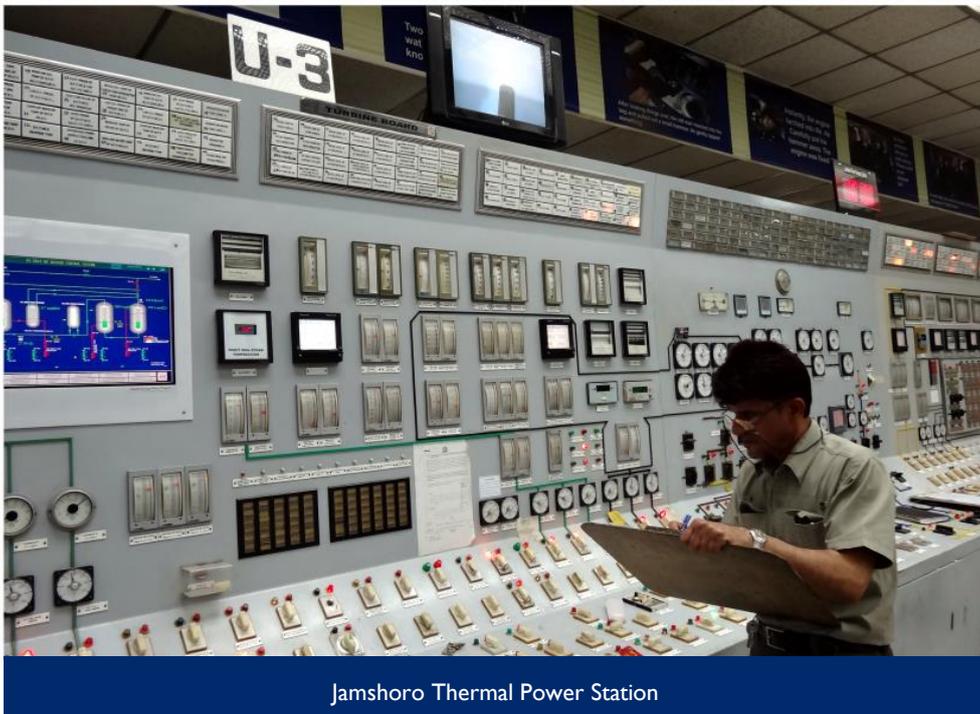
USAID officials along with the Chief Minister Punjab, Mian Muhammad Shehbaz Sharif



Officials of USAID, GOP and Power Plant along with the Chief Minister Punjab, Mian Muhammad Shehbaz Sharif

# JAMSHORO THERMAL POWER STATION REHABILITATION PROJECT

EPP provided support to USAID on calculating the greenhouse gases (GHG) emission reduction at Jamshoro. The reduction in GHG of about 381,149 tCO<sub>2</sub>e is made possible after the improvement in heat rates due to the rehabilitation works.



Jamshoro Thermal Power Station

## COMPONENT 2: POLICY AND REFORM

### SUPPORT TO MINISTRY OF WATER AND POWER

EPP continued working on power sector agreements emanating from the ongoing power sector reforms. The major activities undertaken during the month are as follows:

#### Thermal Power Purchase Agreement

Based on the ongoing consultation with MWP, EPP revised the PPA of May 2015 wherein some editorial improvements and some valid suggestions of JPCL have been incorporated. This latest PPA was submitted on November 20 and has been duly acknowledged by MWP.

#### Connection Agreement

The four drafts of the Connection Agreement prepared by CLM have been reviewed and finalized by EPP. These were submitted to MWP along with a cover letter on November 6. The submission was acknowledged by Joint Secretary (P).

### SUPPORT TO MINISTRY OF PLANNING AND DEVELOPMENT

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

#### Database

- EPP staff on secondment at the Energy Wing provided training to Energy Wing officials on the usage of data repository system. Officials of the Wing have been trained to update the database as per their requirements.
- The daily power demand scenarios were based on input from NPCC. EPP also provided technical assistance to backup data from the computer systems available at the Member Energy office for availability of the same for later access.

### SUPPORT TO MINISTRY OF FINANCE

- Assistance was provided to the Corporate Finance Wing of Ministry of Finance for preparation of their views/comments on the Supplemental Agreement for prioritized and actively promoted projects in the private sector under the China Pakistan Economic Corridor (CPEC) Framework Agreement.
- Assistance was provided to the Corporate Finance Wing and Economic Reforms Unit (ERU) of Ministry of Finance in settling the outstanding issues of Tariff Differential Subsidy (TDS) claims of DSICOs for the month of June and July 2015 in consultation with the Ministry of Water and Power.
- Corporate Finance Wing of Ministry of Finance was assisted in the finalization of their views/comments on the summary for the ECC of the Cabinet submitted by the Ministry of Water and Power proposing some amendments in the Standard Power Purchase Agreement (PPA) for imported RLNG Based Power Plants.
- Assistance is being provided to the Corporate Finance Wing in negotiating the loan for Dasu Power Project through local bank consortium which will be obtained on the basis of WAPDA's own balance sheet.

# SUPPORT TO MINISTRY OF PETROLEUM AND NATURAL RESOURCES

## Liquefied Natural Gas Imports

### Liquefied Natural Gas Procurement

- Comments on the five-year tender documents and related Master Sales Purchase Agreement (MSPA) as well as confirmation notice were provided to Pakistan State Oil.

### Support to Port Qasim Authority

- Updated compliance status of Port Facilities and LNG Terminal with SIGTTO guidelines/US NFPA Code was completed and forwarded to Port Qasim Authority (PQA) for further action.
- In light of the FMBS debriefing report received from Siport, draft revision 8 SOPs and COU have been prepared jointly with PQA.
- Joint review of the response prepared by the consultant on observations of Shell International's Audit Report on LNG operational and navigational aspects was carried out with PQA and the finalized version was forwarded to EETPL by the PQA.
- Day-to-Day support continued for PQA.

## Shale Gas

- Milestone-6 report and Shale Gas/Oil Guidance Document including the regulatory and legal aspects were discussed with the consultants and are being finalized by LMKR/KMR.
- Milestone-7 workshops were held during NuTech visit and the final report is expected to be finalized shortly.
- Hardware (except one item) and software (GGX) for the DGPC office has been delivered.

## Upstream Oil and Gas

- Advisory support to DGPC on regulatory, commercial, legal and other matters is being provided by AEAI professionals.
- Deliverables submitted by PTS were finalized.

## Others

A presentation on the Oil and Gas Program covering LNG Import, Support to DGPC on Upstream Oil and Gas and Shale Gas/Oil Resource and Technology assessment was made on November 12, 2015 which was attended by USAID, MPNR (DGPC and its staff, Deputy Director, DG Liquid Gases, and Chief Technical Officer MPNR) consultants and AEAI professionals. MPNR appreciated the support provided by USAID for undertaking the oil and gas program.

## COMPONENT 3: NEW PROJECTS, PLANNING, AND DEVELOPMENT

### KURRAM TANGI/KAITU WEIR PROJECT

Evaluation of Technical Proposal and financial proposals received for construction of the Kaitu Weir, feeder tunnel linking Kaitu River to Kurram Tangi Reservoir, Two power houses with installed capacity of 18.4 MW, two irrigation canals (Spaira Ragma and Sheratella) is finalized.

Planning Commission PC I of the project amounting to \$126 million is already approved by GOP. Since project cost is increased, WAPDA is revising the PC I of the project based on bidder offered price including transmission line and staff colony cost which were not previously part of PC I.

Milestone dates for funding disbursement and associated payment schedule for the proposed \$ 81 Million USAID funding will be finalized, once project cost is final and contract is awarded to contractor.

### GOLEN GOL PROJECT

USAID has indicated about \$36 million funding for the works related to power house Electrical & Mechanical equipment (Lot 3.2 of contract). Total cost of Lot 3.1 & Lot 3.2 contracts is \$ 75.5 million. Kuwait Fund is providing \$37 Million loan for construction of Powerhouse civil works and some portion of E&M equipment.

EPP provided input to queries on draft PIL Agreement of Golen Gol and resubmitted to USAID.

Project is expected to be completed by August 2017 and will provide 436 GWh of annual energy to National Grid. Revenue from Golen Gol will be over \$33 million a year and this cheaper power will replace electricity production from thermal plants using imported fuel oil of about \$65 million per annum.

## COMPONENT 4: NEW ACTIVITIES

### TRANSMISSION

To date, 915.2 MW of transmission throughput capacity have been added to the PESCO and NTDC networks as a result of USAID EPP assistance.

### PESHAWAR ELECTRIC SUPPLY COMPANY

#### Crane-Mounted Trucks

- Customs clearance of trucks has been completed and these have been delivered. The cranes are likely to be cleared in two weeks after which it will require four weeks for the vendor to assemble them on the trucks followed by a two-day demonstration. The project is likely to close by end January 2016.

#### Power Transformer Program

- Purchase order for three new 40 MVA power transformers has been executed. The two remaining transformers were installed at the Bannu 220 kV grid station and Nowshera City 132 kV grid station. These transformers helped add 28 MVA of throughput capacity to the PESCO network.
- Oil purification plants have been delivered to PESCO. The demonstration on operation and maintenance of these plants is scheduled to end by December 4, 2015.

#### Circuit Breakers

- Thirteen 132kV circuit breakers were installed in the PESCO network, thereby completing all 20 out of 20 Circuit Breakers. . However, seventeen of the twenty installed are in service (operational) while the remaining three will be commissioned once PESCO resolves wiring issues at the respective sites. The project is expected to end by mid December 2015.

### NATIONAL TRANSMISSION AND DESPATCH CENTRE

#### NTDC RTPSS & Design Center

An event, in WAPDA House, Lahore, was held on Friday, November 13, 2015 marking the completion of Design Center upgrades and inauguration of Real Time Power System Simulator (RTPSS) lab. A total of 71 graduates participated in the ceremony out of which 47 represented Design Department whereas the remaining 24 graduates, who got trained on RTPSS, were from NTDC's Planning, Design, Technical Services Group and System Protection departments.

The training program on RTPSS started on Oct 5 and lasted till Oct 29. During this period, the trainees selected from various NTDC departments were trained on using the simulator. The simulator helps NTDC to define interaction b/w AC and DC transmission systems, plan network expansions and carry out transient studies. It also enables NTDC to model intermittent renewable resources (wind and solar) and analyze the impacts addition of renewables add on the grid.

The Design Center upgrades focused on provision of modern-day IT tools, including software and hardware, to NTDC's Design Department. Besides provision of tools, a comprehensive training program on operating the tools was designed for NTDC's engineers. In this regard, forty-seven trainees were selected and trained from Apr 20, 2015 till Jun 19, 2015. The tools help NTDC to design civil structures, towers, transmission lines, grid stations, and drawings and are anticipated to have increased productivity and capacity of Design department's human resources.



US Consul General Lahore addressing the participants at the certificate distribution ceremony of NTDC Design Center and RTPSS at WAPDA House Lahore



Officials of USAID, EPP, NTDC, WAPDA and Trainees of Design Center and RTPSS



Design Center and RTPSS Trainees receiving their certificates from Director Office of Energy USAID



Officials of NTDC, WAPDA, US Consul General Lahore, Director Energy Office USAID, Chief of Party USAID Energy Policy Program along with Trainees of Design Center and RTPSS

## NTDC System Studies

- The model handover workshop was conducted on Nov 25-26 wherein the methodology adopted by consultants was discussed and the actual model used for analysis was run. The simulation results look promising and the stakeholders feel satisfied with the study outcomes. A final video conference is planned in the third week of December.

## Testing Equipment for Grid System Operations

- Four out of eight shipments have been delivered to NTDC. Exemption for two shipments was granted and their clearance is awaited. For the remaining two shipments, exemption is expected by December 4. All shipments are expected to be turned to NTDC by mid December. Upon delivery, the vendor will also demonstrate the testing equipment for NTDC staff.

## Auto Transformer Program

- Installation of the second 250 MVA transformer (replacing the existing 160 MVA auto transformer) at 220kV Mardan grid station started from October 27. The transformer was energized on November 28, 2015 and put on load on November 30, 2015. The transformer has helped enhance NTDC's throughput capacity by 90 MVA.
- Installation of the first 160 MVA transformer at 220kV Nishatabad grid station was completed on November 17, 2015. The transformer has helped enhance NTDC's throughput capacity by 160 MVA.
- Factory Acceptance Test (FAT) of the repaired 220/132kV 160MVA transformer at HEC is scheduled in the fourth week of December.
- The repaired 500/220kV 150MVA transformer's winding has been put back, and its oil filled, while oil dehydration is in progress. Factory acceptance test is underway and expected to be completed by December 10.

## Grid System Information System

- Training on grid system information of Quetta 220kV circle was completed making nine out of nine Grid Circles of NTDC (100%).

## Strategic Business Plan

- Revised draft of strategic business plan was sent to NTDC this month. The performance indicators and score card suggested by EPP were appreciated by NTDC. The comments given by NTDC management are being looked into and EPP will submit a revised draft by 1<sup>st</sup> of December.

## Live Line

- The missing live line tools have been received and are in the process of handover to all concerned DISCOs; the exercise is expected to be completed by December 4.

# PROGRAM SUPPORT ACTIVITIES

## CAPACITY BUILDING

**Live Line Maintenance.** To date, EPP has completed all five refresher courses at IESCO, PESCO, FESCO, GEPCO, and HESCO along with the 14-week LLM trainings for MEPCO, SEPCO, QESCO and LESCO. EPP drafted individual as well as comprehensive assessment reports based on the participant's feedback. EPP will share all the evaluation reports with the DISCOs for future LLM improvements.

**Trainet:** EPP reported all in country, Third Country and USAID training programs on Trainet.

## MONITORING & EVALUATION

**Post-Trainings Evaluations:** EPP conducted the post-training evaluation session and filed training evaluation forms with the Live Line Maintenance crew from Hyderabad Electric Supply Company (HESCO) on October 20, 2015 at HESCO. Moreover, post training evaluation sessions with Real Time Power System Simulator (RTPSS) training participants were conducted on October 27-28, 2015 at NTDC, Lahore.

**Acknowledgement Letters:** As of October 2015, EPP has obtained the following acknowledgement for its accomplished activities from its stakeholders:

CPGCL, NPGCL, JPGCL, Gomal Zam, Satpara, Tarbela, Planning Commission, MOF, ISGS, PQA, PESCO, NTDC, FESCO, IESCO, GEPCO, MEPCO, LESCO, SEPCO and HESCO.

**PakInfo:** EPP is in the process of drafting PakInfo's close-out report. To date, EPP's accomplishments have been updated in the document with November 2015 data entries to follow. Once completed, the report will be shared with USAID for Q1FY2016 PakInfo reporting.

**Confidential information redacted**

# PROCUREMENT AND PURCHASE ORDERS

Item	Achieved or Completed	Targets LOP	% Completion
Procurement contracts	\$36.02 million	\$36.02 million	100%

In the month of November 2015, EPP procurement department completed and issued three (3) Purchase Orders amounting above \$12,044/-. Additionally, work was carried out on the following procurements:

- Successful completion of Installation and commissioning of two (2) 250MVA auto-transformers at Mardan Grid Station.
- Successful dutyfree customs clearance of two (2) Oil Purifications Plants and their delivery at Shahi bagh warehouse, PESCO.
- Successful dutyfree customs clearance of four (4) testing equipment shipments out of eight (8) and their delivery at NTDC Lahore.
- Successful installation of circuit breakers at all 20 sites of PESCO completed; commissioning of ten (10) circuit breakers in progress.
- Installation and commissioning of 160MVA auto-transformer is in process at the Shahibagh grid station.
- Successful event management at NTDC RPTSS, Lahore.
- Successful event management at Muzaffargarh Thermal Power Station (MTPS).
- Successful delivery, installation and commissioning of all three (3) 40MVA Power Transformers at Mardan, Bannu, and Nowsehra grid stations.
- Successful handing-over of USAID non-expandable property to NTDC Lahore and PESCO Peshawar as per USAID approval.

# PROGRESS IN NUMBERS

**Table 3 below** provides EPP indicators, targets, and achievements for November 2015. **Table 4** presents EPP indicators by component for November 2015.

**Table 3: EPP Indicators and Achievements for November 2015**

Indicator	Unit	LOP Target	Achieved in November 2015	Total Achieved as of November 2015	LOP % Achieved as of November 2015
I.a: GWh of energy sold	GWh	7880	1,317.5	11,424.5	145%
I.1.a: Number of beneficiaries with improved energy services due to United States Government assistance	Individuals	13,624,226	2,406,024	19,943,316	146%
I.1.b: GWh of energy availability	GWh	7880	1,317.5	11,424.5	145%
I.1.c: MW available to meet power sector demand as a result of USG assistance	MW	1,303	188	1,838.2	141%
I.1.1.a: MW of electrical power added or saved as a result of USG improvements	MW	875	0	1,027.2	117%
I.1.1.b: Efficiency of thermal power plant tests completed	No.	3	0	3	100%
I.1.1.c: Number of USG supported installations and operations and maintenance improvements	No.	181	3	174	96%
I.1.1.d: Number of transmission bottlenecks resolved	No.	121	3	133	110%
I.1.4.a: Public and private funds leveraged by the USG for energy infrastructure projects	U.S. \$	193.5 Million	0	178.5 Million	92%
I.2.1.a: Number of key policies and regulations in various stages	No.	12	0	50	417%
I.2.2.a: Number of policies following international best practices	No.	6	1	5	83%
I.2.2.b: Number of board recommendations following international best practices	No.	4	0	3	75%
I.2.3.a: Number of best practice-driven systems created, improved, and implemented	No.	10	0	10	100%
I.2.4.b: Number of public forums resulting from USG assistance in which government officials and citizens interact	No.	12	1	10	83%

**Table 4: EPP Indicators by Component November 2015**

Indicator	Unit	Component	LOP Target	Achieved in November 2015	Total Achieved as of November 2015	LOP % Achieved as of November 2015
I.I.a: Number of beneficiaries with improved energy services due to United States Government assistance	Individuals	Total	13,624,226	2,406,024	19,943,316	146%
		I-Generation	7,993,106	0	9,382,406	117%
		IV-Transmission Throughput Capacity	5,477,544	2,406,024	10,379,178	189%
		IV – Transmission Added/Saved	153,576	0	181,732	118%
I.I.b: GWh of energy availability	GWh	I & IV	7880	1,317.5	11,425.26	145%
		I-Generation	4,796	0	5,642.29	118%
		IV-Transmission Throughput Capacity	2999.4	1,317.5	5,683.47	189%
		IV – Transmission Added/Saved	84	0	99.50	118%
I.I.c: MW available to meet power sector demand as a result of USG assistance	MW	I & IV	1,303	188	1,838.2	141%
		I-Generation	863	0	1,013	117%
		IV-Transmission Throughput Capacity	428	188	811	189%
		IV – Transmission Added/Saved	12	0	14.2	118%
I.I.I.a: MW of electrical power added or saved as a result of USG improvements	MW	I & IV	875	0	1027.2	117%
		I-Generation	863	0	1,013	117%
		IV – Transmission Added/Saved	12	0	14.2	118%

# ANNEX I

# ANNEX I: LIST OF KEY MEETINGS

**Table 5: List of Key Meetings Conducted in November 2015**

Meeting with	Date	Location	Purpose	Outcome/Result
<b>Component I: Project Monitoring &amp; Implementation</b>				
CE Tarbela	Nov. 2, 2015	Tarbela Power Station	To monitor and discuss the installation of SCADA equipment's.	WAPDA was advised to expedite the installation to complete it by December 2015.
CEO Muzaffargarh	Nov. 13, 2015	Muzaffargarh Thermal Power Station	To discuss the arrangements for USAID officials visit to Muzaffargarh power plant.	USAID officials Inaugurated the rehabilitated Muzaffargarh Thermal Power Station.
CEO Guddu	Nov. 18, 2015	Guddu Thermal Power Station	To monitor and discuss the installation of bypass dampers	EPP inspected the new equipment and analyzed the problem arrived during installation. CEO informed that the will now outsource this work by floating an open tender on turnkey basis.
MPNR, USAID, EPP, LMKR/NuTECH & KMR, PTS, GRANADA	Nov. 12, 2015	AEAI office, Main Conference Room, Islamabad	Presentation on USAID support for the petroleum sector covering LNG Import, Support to DGPC on Upstream Oil and Gas and Shale Gas/Oil Resource and Technology assessment.	<ul style="list-style-type: none"> <li>• USAID highlighted the significance of the petroleum sector in overcoming the energy crisis in Pakistan and USAID's role in supporting MPNR as part of the Energy Policy Program.</li> <li>• USAID appreciated the efforts of EPP and the team of specialized consultants and recognized the significant achievements in the petroleum sector.</li> <li>• USAID also thanked MPNR for their support and coordination.</li> </ul> <p>MPNR appreciated all the support provided by USAID and requested for the continuation of this support in future.</p>

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