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AFGHANISTAN ENERGY EXECUTIVES BENCHMARK PROGRESS WITH U.S. UTILITY AND REGULATORY BEST PRACTICES

NOVEMBER 2013 – WASHINGTON, DC, BALTIMORE & ANNAPOLIS, MARYLAND – Supported by the U.S. Agency for International Development (USAID), eleven executives from Afghanistan’s state-owned electricity utility **Da Afghanistan Breshna Sherkat (DABS)**, **Ministry of Economy**, **Ministry of Finance**, **Ministry of Energy and Water**, and **Ministry of Mines and Petroleum** travelled to the U.S. The delegation held meetings with their counterparts to review U.S. best practices in power generation, transmission and distribution systems, electricity market operations, and regulation and finance. USAID organized this exchange to support the continued development of the electric power sector of Afghanistan by sharing best practices and experiences with energy leaders in the U.S.



USAID met with the delegation to discuss USAID energy programs and priorities in Afghanistan



PRIMARY TOPICS OF THE EXCHANGE

The delegation of eleven senior executives from Afghanistan spent eight days visiting various utilities, regulatory bodies and energy sector organizations in the Washington, DC and Maryland area, reviewing methods to advance Afghanistan’s power sector. Key focus areas of the program included:

- **Power Generation**
 - Best practices in operation and maintenance of power plants
 - Strategic planning for power generation and fuel source decision-making
 - Efficiency and reliability improvement strategies

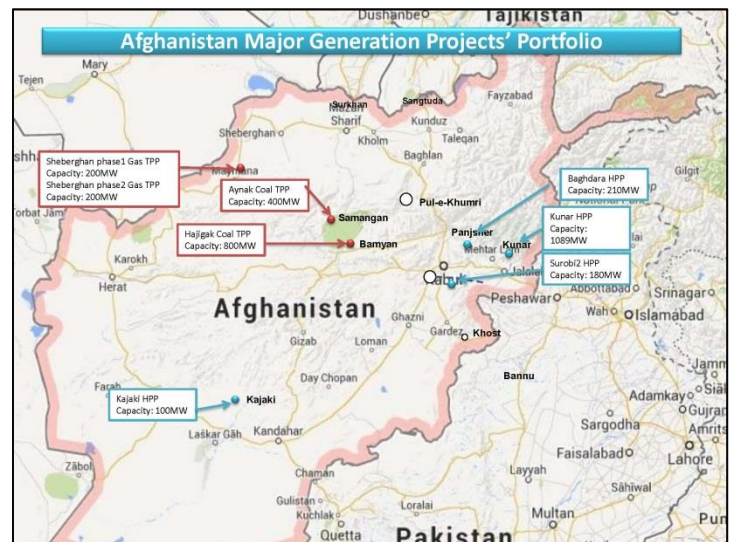
- **Transmission Systems**
 - Best practices in operations and maintenance
 - Ancillary services
 - Congestion management
 - Wheeling mechanisms, including cross border transfers
 - Planning & asset management
 - Transmission scheduling
 - Power dispatch
 - Data collection & modeling
 - International transmission standards (grid codes) to ensure the reliability of cross-border transmission systems
 - Requirements to meet industry standards for power pool operations
 - Tariff setting mechanisms for cross-border energy exchange (wheeling charges, retail charges)

- **Distribution Systems**
 - Best practices in operations and maintenance, including loss reduction and efficiency methods
 - Billing, collections & customer service
 - Capacity acquisition
 - Demand side management
 - Integrated resource planning & cost/benefit analysis
 - Emergency response

Afghanistan Power Sector Briefing

DABS CEO Razique Samadi provides an overview of the current status of the Afghan power sector at a public briefing at USEA’s offices for USEA members and officials from U.S. government and industry.

To achieve the goal of providing power supply for whole Afghanistan, Afghanistan has established a **Power Sector Master Plan** that includes a large investment effort for all the transmission reinforcement and development. This will require a total investment of \$10,096m – \$7,330m for generation development and network integration; \$1,727m for major transmission projects and \$1,040m for transmission network development within the provinces to be concluded by 2032. The total investment for stage A is estimated at \$1,213m. Stage B will require \$1,465m while stage C and stage D will require about \$1.410m and \$6.010m. The high investment in Stage D is related to the hydropower plants.



- **Electric Market Operations**
 - Structure of an electricity market
 - Pricing mechanisms
 - Power trading strategies
 - Managing energy markets & market monitoring

- **Electricity Regulation & Finance**
 - Role of the state and national regulator
 - Incentivizing independent power production
 - Ancillary services
 - Tariff setting and open access tariff structures
 - Reliability standards



Delegation at the Embassy of Afghanistan



Federal & State Regulation

Left: Dr. Phylcia Bowman (center), Executive Director of the **Public Service Commission of the District of Columbia**, discusses the function of the state regulator and its role in incentivizing generation, ancillary services, tariff structures, and reliability.

Below: Delegates met with representatives from the **Federal Energy Regulatory Commission (FERC)**. FERC is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines as well licensing hydropower projects.



BEST PRACTICES INTRODUCED

Over the course of the program, the Afghanistan delegation was exposed to numerous best practices in all facets of the electricity sector – from policy and regulation to generation, transmission and distribution. These included:

Regulation & Energy Policy:

- Regulatory body structure and organization to ensure independence and fairness
- Regulatory procedures and operational policies of federal and state regulatory bodies
- Performance standards and incentive programs for efficient and reliable power distribution
- Strategies for involving all stakeholders, including the private sector, in energy policy formation
- Mechanisms to foster independence, transparency and quality policymaking
- NERC's formal process for development of Reliability standards

Energy Markets:

- Best practices in market operations, pricing mechanisms, power trading strategies, congestion management, wheeling mechanisms, transmission scheduling, power dispatch, and data collection and modeling
- Process of forming a market through integration of smaller markets, and the constantly evolving nature of market formation and limitations of static roadmaps



Transmission Regulation & Operation

Left: NERC (**North American Electric Reliability Corporation**) hosts the delegation to share how they ensure reliability of the bulk-power system in North America, enforce and assess reliability.

Right: **PJM Senior Lead Trainer John Gdowik** provides an overview to the delegation of the

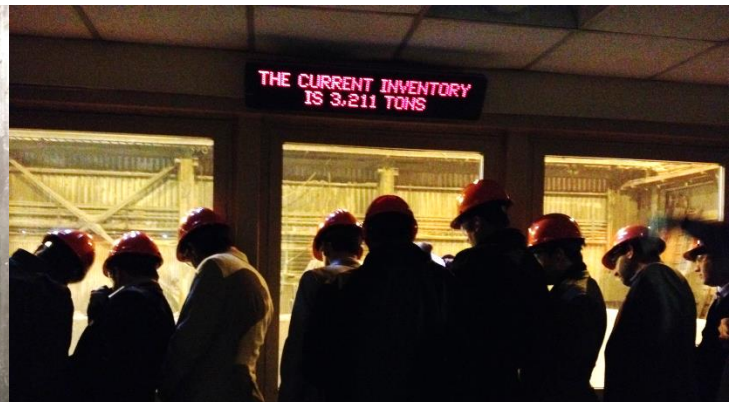
U.S. power sector system, including pricing mechanisms, market power trading strategies, congestion management, wheeling mechanisms, transmission scheduling, power dispatch, and data collection and modeling.



- Energy prices will not necessarily decrease in a market environment; however, it does improve energy security and stability
- Overview of wholesale and retail market configurations
- Process for procuring capacity and assuring resource adequacy
- Generation interconnection procedures to determine the optimal point of interconnection, establishing an interconnection queue, and cost allocation
- Model contracts for transmission infrastructure construction and operation
- Setting maintenance outage schedules
- Rights of transmission provider to require generators to increase or curtail generators energy output to maintain system reliability
- New transmission infrastructure can be incentivized through competition in the market place, efficient spot pricing of electricity and return on investment
- Best practices in development of a power purchase agreement (PPA), including the financial, logistical, legal, and technical aspects

Clean Energy:

- Programs used by U.S. utilities and regulators to promote clean energy, such as renewable energy portfolio standards (RPS), energy efficiency standards, project development financing, research and development financing, and creating sound policy and regulatory atmospheres
- Waste-to-energy as a power source in urban areas



Waste-to-Energy

The delegation visited the **Baltimore Refuse Energy Systems Company (BRESKO)**. BRESKO has been providing disposal of up to 2,250 tons per day of municipal solid waste from since 1985. This recycled energy is recovered in the form of high-pressure steam. At full capacity, the plant can generate in excess of 500,000 pounds of steam per hour. Part of the steam is used to make electricity and the rest is used for district heating and cooling. BRESKO is capable of supplying up to 300,000 pounds of steam per hour to Veolia Energy, which distributes the steam to buildings in downtown Baltimore. BRESKO can also produce up to 60,000 kilowatts per hour for sale to the electrical power grid.



Baseline Peaking Generation

Left: The delegation visit the **Perryman Generating Station**, owned and operated by **Exelon Power**, a business unit of Exelon Generation. Perryman is a five unit, 353.6 megawatt (MW) fossil power plant located in Baltimore, Maryland. Four of the units at Perryman are oil fired combustion turbines. The fifth unit is fueled by natural gas and was added to the plant in 1995. The units at Perryman are used as needed for peak demand periods.

Perryman joined Exelon Power's fleet in 2012 through Exelon's merger with Constellation.



State & Federal Policy

Left: **Maryland Energy Administration** shared their efforts to promote affordable, reliable, clean energy. MEA's programs and policies help lower energy bills, fuel the creation of green collar jobs, address environmental and climate impacts, and promote energy independence.

Right: James McGlone, Infrastructure Systems Analyst for the **U.S. Department of Energy**, provides a presentation on infrastructure protection and grid reliability.



Demand Side Management:

- Using Demand Side Management (DSM) to control consumption, especially in a country like Afghanistan where a supply-demand gap exists. DSM can provide overall energy savings, improve reliability, increase revenue (through reduced power theft or reducing costly peak demand), and positively impact tariff subsidies.
- Baltimore Gas and Electric (BGE) and the Maryland Public Service Commission shared a number of methodologies to encourage energy efficiency and conservation amongst their customers. BGE's "Smartenergy Savers Program" offers a variety of options to save energy, money and the environment for residential and commercial customers. Plus, these programs support the EmPOWER Maryland Energy Efficiency Act. The utility's residential and commercial customer energy efficiency programs include "check-ups" to identify methods the customer can adopt to reduce their energy consumption, appliance rebates and recycling programs, HVAC rebates, and various incentive and technical assistance programs.

Information Technology:

- Using IT to ensure a reliable power system. The IT network is the communication tool between the grid stations, distribution, customers, and the utility staff.
- Cyber security specific methods can be used to ensure proper management of the system, manage incidents and reduce threats.

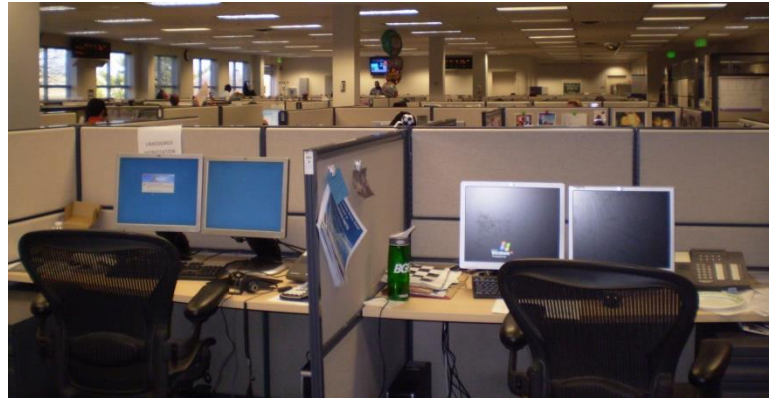
Revenue Protection, Enhancement and Assurance:

- Afghan delegates were provided with methodologies for recovering revenue from customers, including defaulters.

- The delegation witnessed the enormous benefits of Automatic Meter Reading (AMR), which include reduced meter reading expenses, increased accuracy, improved reliability, and reduced likelihood of tampering or theft.

Customer Relationship Management:

- Customer Service departments should establish guiding principles and standards for processing all types of customer requests. Standards should be steadily raised and regular performance audits conducted.
- Monitoring performance at Consumer Care Centers and Call Centers should be connected with an incentive scheme, including monitoring through scorecards with rewards and acknowledgements given to best performers.
- Complaint management should be tracked through a detailed complaint registration and status update system.
- Staff should receive a variety of regular and ongoing training, including soft skill and behavior training, as well as refresher trainings and daily briefings.
- BGE provided the delegation with an overview of their customer relationship system, including its operational and technological benefits.
- Key Performance Indicators for customer service implemented by BGE, such as average waiting time and average serving time. The utility had a number of measures to ensure customer service quality, prompt response to customer and the importance of respecting the customer.



Utility Operations

Baltimore Gas and Electric (BGE) Call Center. BGE's Customer Relations is comprised of 214 representatives who field over 7 million customer calls and internet inquiries, in addition to over 43,000 emails per year. Calls are received 24/7 at two separate call centers, using an Interactive Voice Response (IVR), virtual hold, interpretation, call overflow, and predictive dialer systems. The Call Center handles disputes, outage reports and billing inquiries.

EXCHANGE PROGRAM PARTICIPANTS

1. Mr. Abdul Razique Samadi, Chief Executive Officer, Da Afghanistan Breshna Sherkat (DABS)
2. Mr. M. Mohd Hadi Alami, Human Resources Director, DABS
3. Mr. Mirwais Alami, Chief Commercial Officer, DABS
4. Mr. Mir Abdullah Mashkooari, Director of Project Design, Ministry of Economy
5. Mr. Neak Mohammad Mohibi, Infrastructure & Natural Resources Sector Manager, Ministry of Finance
6. Mr. Mohammad Naseem Ganji, Commercial Director, DABS
7. Mr. Sayed Hussain Yousefi, Director, IT & Information Systems, DABS
8. Mr. Abdul Wahab Taib, Head of Accounting, DABS
9. Mr. Ahmad Abdullah Nasrati, Hydro Power Energy Planning Director, Ministry of Energy and Water
10. Mr. Ahmad Yama Aimaq, Director, Project Management Office, Ministry of Mines and Petroleum

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