Afghanistan: Addendum to the Afghanistan Power Sector Master Plan

Project Name
Addendum to the Afghanistan Power Sector Master Plan

Project Number
43497-013

Country / Economy
- Afghanistan

Project Status
Closed

Project Type / Modality of Assistance
- Technical Assistance

Source of Funding / Amount
TA 8475-AFG: Addendum to the Afghanistan Power Sector Master Plan

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Technical Assistance Special Fund</td>
<td>US$ 225,000.00</td>
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Strategic Agendas
- Inclusive economic growth

Drivers of Change
- Governance and capacity development

Sector / Subsector
- **Energy** / Energy sector development and institutional reform

Gender

Description
The Policy and Advisory Technical Assistance (PATA) supported Afghanistan in preparing its Power Sector Master Plan (the Master Plan) whereby (i) a 20-year demand forecast was produced, (ii) generation and import supply options were analyzed and optimized, (iii) a transmission network was designed to link supply to demand, and (iv) a 10-year investment plan was prepared. A consulting firm, Fichtner GmbH & Co. KG (Germany), was selected as the PATA consultant in October 2011 using quality- and cost-based selection method. In April 2013, the consultant presented the final report to the government and a wide selection of stakeholders in Kabul. The report was approved by the Ministry of Energy and Water, the executing agency. The consultant completed its assignment in May 2013 with an excellent performance evaluation rating. The PATA was closed on 30 June 2013.

Project Rationale and Linkage to Country/Regional Strategy
The Policy and Advisory Technical Assistance (PATA) supported Afghanistan in preparing its Power Sector Master Plan (the Master Plan) whereby (i) a 20-year demand forecast was produced, (ii) generation and import supply options were analyzed and optimized, (iii) a transmission network was designed to link supply to demand, and (iv) a 10-year investment plan was prepared. A consulting firm, Fichtner GmbH & Co. KG (Germany), was selected as the PATA consultant in October 2011 using quality- and cost-based selection method. In April 2013, the consultant presented the final report to the government and a wide selection of stakeholders in Kabul. The report was approved by the Ministry of Energy and Water, the executing agency. The consultant completed its assignment in May 2013 with an excellent performance evaluation rating. The PATA was closed on 30 June 2013.

The PATA forecasted a five-fold increase in Afghanistan energy demand from 700 MW in 2012 to 3,500 MW in 2032 with new demand to be met from a combination of increased imports and new domestic generation. The PATA recommended that Afghanistan should move from a multi-island network (currently 10 islands) to development of an integrated grid, thereby increasing reliability of supply and allowing planned new domestic power plants (being too large to supply small island networks) to supply a country demand. To resolve synchronization issues, the interconnections will utilize high-voltage-direct-current (HVDC) back-to-back convertor stations. The recommended investment program was based on an optimization study of various alternatives. The PATA further recommended that such an integrated grid operating asynchronously with neighboring countries would allow Afghanistan to be a transit country for exports from energy-rich Central Asian countries to energy-deficient Pakistan. This concept of linking Central Asia to Pakistan is referred to the acronym TUTAP of the connected countries Turkmenistan, Uzbekistan, Tajikistan, Afghanistan, and Pakistan.

A separate regional concept of linking the Kyrgyz Republic and Tajikistan to Pakistan via Afghanistan, referred to as CASA-1000, has been under development over the last decade by the World Bank. The $1 billion project is primarily designed to supply Pakistan in summer season with hydropower plant summer surplus in Tajikistan and the Kyrgyz Republic but also has the potential to partially supply Afghanistan. The project envisages a HVDC line from Tajikistan to Pakistan with an alternating/direct current (AC/DC) convertor station in Kabul. During preparation of the Master Plan, CASA-1000 was considered to be an inter-regional project focusing on Central Asia and Pakistan, with Afghanistan mainly playing a transit role. With unconfirmed schedule, financing and power supply to Afghanistan only during the summer season (already being provided from Tajikistan over existing lines), CASA-1000 was considered peripheral to the Master Plan.

Since the PATA closing in June 2013, the World Bank has confirmed that CASA-1000 is a high-priority project to be expedited and considered by its Board in Q1 2014. Should CASA-1000 go ahead, it will have an impact on the Master Plan findings by (i) bringing potential additional hydropower plant summer supply, and (ii) allowing Afghanistan to import power to its proposed unified grid power in excess of its needs which could then be exported to Pakistan via the CASA-1000 Kabul AC/DC convertor station. The Master Plan needs to be updated to address these impacts.

The World Bank has recruited consultants to assess the impact of the Master Plan on the CASA-1000 concept with the consultant's report due to issue in October 2013.
draft of the report received in September 2013 presents alternative synchronization and grid configuration options which should be examined and commented on by the consultants of the Master Plan.

A separate matter, there is a requirement for Turkmenistan and Afghanistan to sign a Power Purchase and Sales Agreement (PPSA) as a condition for disbursement under the ongoing ADB-financed project. As the PPSA remains unsigned, Afghanistan needs to urgently consider the impact of deferring Turkmenistan imports.

While training was provided under the PATA, the executing agency still has insufficient capacity to prepare or update the Master Plan. The S-PATA will assist the executing agency in preparing an addendum to the Master Plan to incorporate changes and alternative scenarios.

Due diligence of the second Afghanistan Energy Multitranche Financing Facility (MFF) will be conducted in the first half of 2014. The addendum to the Master Plan is also required to allow (i) the MFF investment plan to be prepared, and (ii) priority projects to be identified. The addendum, to be finalized by early 2014, was requested by the Ministry of Energy and Water.

Impact

Increased energy security in Afghanistan

**Project Outcome**

**Description of Outcome**

Improved Ministry of Energy and Water ability to analyze and program investment in the power sector

**Progress Toward Outcome**

Once updated, the AFG Power Sector Plan will be a useful document for the Interministerial Committee on Energy (ICE) in planning and programming investments in the power sector.

**Implementation Progress**

**Description of Project Outputs**

Updated Afghanistan Power Sector Master Plan

**Status of Implementation Progress (Outputs, Activities, and Issues)**

A Final Report has been submitted. This report will be presented to MEW, DABS and donor partners in Oct/Nov.

**Geographical Location**

Nation-wide
Summary of Environmental and Social Aspects

Environmental Aspects
Involuntary Resettlement
Indigenous Peoples

Stakeholder Communication, Participation, and Consultation

During Project Design
The tasks are limited in undertaking research and analysis thus, no stakeholder participation and consultation is envisaged.

During Project Implementation
Consultations in updating the Afghanistan Power Sector Master Plan were held with the Ministry of Energy and Water (MEW), Da Afghanistan Breshna Sherkat (DABS), and donor partners.

Business Opportunities

Consulting Services
The S-PATA requires approximately 6 person-months of international consulting services comprising of (i) 2 person-month of a specialist on interconnecting power systems, (ii) 1 person-months of a specialist on HVDC technology, (iii) 2 person-months of a specialist on power system modeling and simulation, and (iv) 2 person-months of an economist and financial specialist. The consulting services commenced in December 2013, and expected to complete by 30 November 2014.

Contact

Responsible ADB Officer
ADB Disclosure
Responsible ADB Department
Central and West Asia Department
Responsible ADB Division
Energy Division, CWRD

Timetable

Concept Clearance
28 Nov 2013
Fact Finding
MRM
Approval
04 Oct 2013
Last Review Mission
Last PDS Update
Funding

TA 8475-AFG

<table>
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<tr>
<th>Approval Date</th>
<th>Signing Date</th>
<th>Effectivity Date</th>
<th>Closing Date</th>
<th>Revised Date</th>
<th>Actual Date</th>
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**Milestones**

Financing Plan/TA Utilization

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<th>ADB</th>
<th>Cofinancing</th>
<th>Counterpart</th>
<th>Total</th>
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<td>225,000.00</td>
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**Cumulative Disbursements**

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<th>Date</th>
<th>Amount</th>
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<tr>
<td>17 Jun 2022</td>
<td>209,116.04</td>
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