Energy Sector Update

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Energy Sector Action Plan

Approved October 2009

Energy security and efficiency, affordability

Energy Demand/ Supply Balance and Infrastructure

Regional Dispatch and Regulatory Development

Energy Water Linkages

Regional Institutions

- Regional power dispatch center
- International Fund for Saving the Aral Sea (IFAS)
- Energy Sector Coordinating Committee

Rich Energy Resources

Oil, Gas, Water, Wind, Coal

- Extensive reserves and renewables
- Diversity of resources
- Uneven distribution across countries

Export Opportunities

- South Asia
- China
- EU
- Russia

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RESULTS

ACTIONS

RESOURCES

Activities to Date

Investment (See next slide)

Capacity building

- Alternative models for regional; trade and interconnection (2 sessions)
- Energy-water modeling (cross-sectoral workshop)
- National energy programs (Mongolia, Kyrgyz Republic)

Dialogue

- In-country consultations on each of the three Pillars
- 3 ESCC meetings since last MC meeting
- Discussions with regional water institutes (to combine energy and water specialists)

Analysis

- Pillar 1: Energy Demand/Supply Balance Diagnostic Study
- Pillar 2: Diagnostic Study on Regional Dispatch and Regulation
- Pillar 3: Progress report: Analytical and Modeling Architecture

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2010 New Energy Investment Projects in CAREC Countries

Institution	Project	Amount ($M)	Status
ADB	AFG MFF Tranche 3 – electrification and HPP rehabilitation in Gereshk	77 (44 - ADB; 33 - DIFID)	2010
	KGZ (Loan/Grant) – Power Sector Improvement	56 (45 - ADB; 11 - KGZ Gov)	Approved
	PRC (Loan) District heating and gas pipeline rehabilitation	150	Approved
	TAJ (Grant) - Regional Transmission Project	122	Approved
	UZB (Loan) - Talimarjan Power Project	300	Approved
World Bank	KGZ (Grant) Emergency support	4	Approved
	TAJ (Grant) Emergency winter shortage support	15	Approved
	UZB (Credit) Energy Efficiency Fund for Industrial Enterprises	25	Approved
	KGZ (Grant/Credit) Emergency recovery project (covering budget and energy sector)	70	Submitted to Board for approval.
	KAZ (Loan) Alma Transmission Project	78	Under process

Energy Demand/Supply and Infrastructure

SEP 2010

NOV 2010 - NOV 2011

DEC 2011

Diagnostics Study

CAREC Institute

Regional Power Sector Master Plan

AFG, KAZ, KGZ, TAJ and UZB

- AFG synchronization with Central Asia regional grid

ADB

Investment Plan

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Pillar 1: Demand/Supply Balance and Infrastructure Constrains

1. **Objective**

- Evaluate the energy supply/demand balance and infrastructure constraints,
- Identify status of completed, ongoing and planned energy projects which impact intra-regional power trade

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Pillar 1: Demand/Supply Balance and Infrastructure Constrains

2-1. Findings

- Challenges affecting regional power trade:
  - Technical: Interconnections; Controls, Protection, Supervisory control systems (SCADA/ACDA), Synchronicity; Metering and Accuracies
  - Commercial: Market Mechanisms; Fair Trade; Financing of the regional projects and cost sharing
  - Political: Willingness and commitment
- Significant inter-trade opportunities (20+ TWh) within existing regional generation (160 TWh)

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Pillar 1: Demand/Supply Balance and Infrastructure Constrains

2-2. Findings

- Energy efficiency is critical to reduce losses.
- Energy self-sufficiency is a stepping-stone to regional interconnection. New transmission assets should be designed with interconnection in mind.
- Many projects complimentary to Regional inter-trade (esp. small HPPs) await financing. These need to be prioritised and the feasibility studies validated.

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Pillar 1: Demand/Supply Balance and Infrastructure Constrains

3. CAREC Support Program

Challenge	ESCC Actions
1. Technical	Regional Master Plan, Investment Prioritising, Supply/Demand Management
2. Commercial	Capacity Building Program in coordination with USAID REMAP II
3. Political	Platform for mutually beneficial dialogue

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Regional Dispatch and Regulation

SEP 2010

2010 - 2012

Diagnostics Study — WORLD BANK

Capacity development - Energy Regulators — CAREC Institute

Regional Energy Market Assistance Program II — USAID

Regulatory And Institutional Development — WORLD BANK

Investment Plan

Institutional refinement

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Pillar 2: Load Dispatch and System Operation Study for Central Asia Power System

Current Situation in Central Asia:

- Power trade 10% of 1990s levels; two of five countries disconnected. Result:
  - Water spillage, fossil fuel losses and less clean energy
  - Expensive frequency regulation in thermal-based countries
  - Transboundary water tensions and conflicts, with spill-over effects on non-power sectors

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Pillar 2: Load Dispatch and System Operation Study for Central Asia Power System

Benefits of Integrated Operations:

- Reduced costs from lower fuel use ($1.5 billion over next 3 years without quantifying benefits of unserved energy), and avoided capital expenditures for secondary reserves (up to 300MW)
- Increased reliability
- More efficient operation of thermal plants, resulting in increased fuel efficiency and reduced air emissions

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Pillar 2: Load Dispatch and System Operation Study for Central Asia Power System

Recommendations:

- Short-term: Increase power trade without changes in national regulation or power sector organization
- Medium term: Realize integrated power system operation with modern tools (metering, supervisory control, and real time dispatch and settlements, etc)
- Long term: Create an efficient regional energy market (implement regional generation and transmission projects)

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Energy Water Linkages

Sept 2010

April 20 11

Dec 2011

Diagnostics

World Bank

Phase 1a: Analytical and Modeling Architecture

Phase 1b: "First Generation" Model

World Bank

Phase 2:
- **Data collection and sharing**
- **Institutional platform for analysis and dialogue**
- **Detailed model enhancement**

World Bank

Institutional refinement

Investment Plan

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Pillar 3: Energy- Water Linkages
Phase 1a: Analytical and Modeling Architecture

Key findings from national and regional discussions:

1. **Need**
   - Countries welcomed the proposed energy and water initiative and agreed to develop an independent, transparent and technically acceptable energy-water model.
   - The various existing models and analytics have not satisfactorily brought together the broad range of sectors nor embedded national goals and priorities.

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Pillar 3: Energy- Water Linkages
Phase 1a: Analytical and Modeling Architecture

2. Design

- Model architecture and output variables should capture national aspirations. While integrating national aspirations, there needs to be a connecting regional model to understand the current and future energy water issues.
- The decision support system must: (i) ensure data sharing and transparency; and (ii) analyze a range of scenarios and describe economic and commercial implications.
- Basins of all transboundary rivers and their tributaries are to be included.

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Pillar 3: Energy- Water Linkages
Phase 1a: Analytical and Modeling Architecture

3. Institutions

- A more complete review of existing models will be undertaken.
- The decision support system for energy and water will require an institutional platform based on mutual respect.

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Capacity Building Program for 2011

Pillar 1

- Cross-border Clean Development Mechanism (CDM)
- System planning and optimization software

Pillar 2

- Strengthening legal and regulatory framework (domestic and bilateral/regional)
- Energy trade & grid management compliance systems

Pillar 3

- Joint investments in hydropower development at international rivers

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Next Steps

- Nominate and confirm alternate Focal Points (not all CAREC members nominated yet)
- Nominate two subcommittee specialists for each Pillar (not all CAREC members nominated yet)
- Proceed to next steps in work plan
  - Complete Regional Power Sector Master Plan
  - Identify priority activities in coordination with USAID REMAP II and implement short term actions;
  - Prepare detailed terms of reference for energy-water analytical and institutional frameworks
- Conduct Capacity Building Program

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Discussion Topic

Three main challenges (technical, commercial, political) hamper regional power trade. CAREC ESCC addresses all of the through various modalities.

What other actions, mechanisms or information sharing tools should CAREC undertake to efficiently address issues affecting regional power trade?

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