

## Regional Dispatch and Operation of Central Asia Power System

### ESCC Central Asia Energy Action Plan and Regional Dispatch (Pillar 2)

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The ESCC Central Asia Energy Action Plan was approved by the CAREC SOM in October 2009 and further by the Ministerial conference in November 2009. It explores opportunities for regional integration through power development, with only indirect assessments for bulk management of oil, gas and coal resources. The second Pillar of the Energy Action Plan, Regional Dispatch and Regulatory Development, aims at maximizing the benefits of increasingly coordinated operations between the Central Asian (CA) countries. It entails moving towards identifying key constraints in coordinated operation of CA and a plan to work on resolving these constraints, developing institutional capacities, and enhancing the technical capabilities and the role of national dispatch centers and Central Dispatch Centre (CDC).

This background paper provides a brief summary of the follow up on the discussions during the last CAREC ESCC meeting in September 2010, and developments thereafter.

The results of a diagnostic study on the opportunities of enhanced cooperation between the CA members were presented during the ESCC meeting in September 2010. The study estimated that the benefits of a fully functional cross border trading system between CA members would be about \$1.5 billion dollars during 2010-2012. However, even if all these benefits were not realized, there are several opportunities to gain significant savings without additional investments. For example, every 100 GWh of additional summer surplus from hydropower producing countries is worth 2 million USD in trade at even a low value of only 2 US cents per kWh. Exported at that price to a power system currently using gas-fired generation would save about 5.4 million USD. This means that 100 GWh of coordinated additional trade in summer would result in benefits of more than 7.4 million USD.

The study also estimates that the system peaks for each CA member operating separately during the summer is about 11800 MW. If the system were to increase the level of cooperation and interconnection, the total peak summer demand would drop to 11600 MW, resulting in a reduction of 200 MW in peak load capacity. Similarly, in the winter the aggregate peak load for isolated country operation was estimated to be about 14658 MW but the peak system load would drop to 14527 MW under fully coordinated dispatch. This would reduce the need for available capacity by more than 130 MW during winter.

The study also identified the need to re-create confidence of CA members in the process and benefits of joint operation. It proposed a range of measures that would begin to build a more collaborative climate in the CA countries. These measures could be organized in three stages:

1. **Short-term and low cost measures.** These measures could increase power trading without requiring changes in the regulation and organization of power sectors in the countries by:
  - Improving technical measures for coordinated operation of the Grid, e.g. protection coordination and primary frequency control;
  - Defining a scheme for mutual support during emergencies, including an appropriate price for energy support; Improving and/or implementing efficient settlement of deviations and transit service compensation and effective methods of dispute resolution;

- Organizing focused discussions and capacity building of all involved stakeholders to disseminate information on about the potential benefits, and preparing agreed measures to realize these benefits.
2. **Medium-term and intermediate costs measures.** These measures would focus on the application of modern tools and technologies to increase the benefits of integrated power system operations by:
- Installing commercial metering and improving supervision and control hardware;.
  - Implementing software for daily dispatch, real time re-dispatch, post operation calculations and settlement of deviations and transit compensations;
  - Identifying the requisite expansion of the regional transmission system that would optimize joint operation by CA members, including transactions with neighbouring countries.
3. **Long-term and higher costs measures.** These measures would aim to create an efficient regional energy market by:
- Developing regional scale projects that can provide energy security, profitable exports, and reduce emissions;
  - Enhancing transmission and generation system planning across the region;
  - Developing modern market-based trading mechanisms and regulation.

#### **Technical Support Program from USAID available now**

In December 2010, USAID announced the next phase of their energy sector partnership program in Central Asia, now called Regional Energy Security, Efficiency and Trade.(RESET). Consistent with and taking the Energy Action Plan forward, this program will provide technical and advisory support that would help to:

- strengthen national and regional transmission system planning, control and coordination,
- develop efficient and sustainable investment in national and regional electricity systems,
- expand electricity trade within and beyond Central Asia, and
- build capacities for designing and implementing market-based solutions to regional issues.

#### **Sub- committee Nominations received from countries:**

The CA members agreed to establish a Pillar 2 sub-committee to prioritize activities to take advantage of the short term, low cost opportunities. All CA countries have announced their nominations for the sub-committee for this area.

#### **Going Forward**

- i) The CA members have identified the “low hanging fruit” i.e. immediate opportunities for easing constraints or improving coordinated grid operation, without any major investments. To discuss prioritizing of low cost, short term activities, a sub-committee meeting would need to be organized. The sub-committee meeting was delayed as it was planned to use the opportunities posed by RESET program. The RESET program is now in place and a sub-committee meeting to decide priorities of measures to select

measures to improve grid coordination and twin with other proposed actions in future for this Pillar is proposed to be held on a date convenient to countries and other participants.

ii) A set of capacity building activities by USAID is planned related to developing and using international commercial agreements related to project development and power trade, strengthening transmission planning, metering cross-border power flows, and best practices in designing and operating power markets, among others.

The **CAREC Members Electricity Regulators Forum** established in 2005 has been integrated into Pillar 2 activities, and it is proposed that it be reactivated with the support of the CAREC Institute. Together with other capacity building activities selected by the ESCC participants, this would help strengthen energy regulation and sector reforms to ensure the sustainable development of national energy systems. It is proposed that ESCC consider the proposal for capacity building on the regulatory aspects of energy sector development to decide the best way to exchange ideas, learn about best practices and build practical skills.