

CAREC Energy Sector Coordinating Committee Meeting (ESCC)
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Regional Dispatch and Regulatory Development
(Backgrounder)

1. Description of Issue

The Central Asia Power System (referred to as CAPS) is a bulk power transmission network system, which was formed in the Soviet Union era, and covers the Central Asian countries of Uzbekistan, the southern part of Kazakhstan, Kyrgyzstan and Tajikistan. Turkmenistan has been an intermittent participant of this system. The installed capacity of the three countries in Central Asia (Uzbekistan, Kyrgyzstan and Tajikistan) and the southern system of Kazakhstan is approximately 23,000 MW. As for power generation facilities, hydropower generation accounts for some 40% and is the dominant electricity resource in Tajikistan and Kyrgyzstan; while thermal power generation makes up the rest for the entire region, excluding Turkmenistan.

With such skewed distribution of energy generation resources, the importance of strong transmission was realized in Soviet time. The Central Asian countries were bestowed with strong power transmission networks in the region- constituting about 1,600 km of 500 kV and 1,400 km of 220 kV lines. This network is operated by the Coordinating Dispatcher Center for energy (CDC) in Tashkent, which monitors and controls the demand-supply balance, power voltage and frequency. CDC is a nongovernment noncommercial organization working under the apex power council, constituting heads of power utilities/ transmission companies of the four countries.

The adequate utilization of an extensive transmission network like CAPS depends a lot on development of facilities to dispatch and coordinate the power flows, and a proper regulatory and institutional system to manage and maximize the benefits to participants. As of now, electricity trade has been dominated by bilateral and multilateral agreements. With gradual introduction of market based trading, the CAPS could be utilized to full potential and also play a role in facilitating generation investments through private players while sparing the public resources for other important activities. It would also provide a good platform to trade more power during summer surplus months and winter deficit months as well as promoting exports to other regions. Introduction of the competitive market in Kazakhstan has indicated several opportunities for benefits of a combined market for the regional participants.

The facilities at CDC are very old and would need significant investments to bring these at par with modern control and dispatch centers. Kazakhstan has already initiated steps to modernize the national control center and its nine regional control centers. Similar investments would also be needed in the national dispatch centers of all the member countries. To complement these facilities, institutional systems to regulate and manage the system through a central entity (having confidence of all the players) would be required.

There exist several unexplored potential opportunities for synergy for operation as an integrated CAPS, which need to be capitalized for the increased gains of member countries. Some of these are listed below and are only indicative:

- There is complementary mix of the generation resources with differing strengths and weaknesses: thermal in some countries and hydro¹ with storage in others. An optimal mix could bring all round benefits while reducing the energy security risks of individual, national systems. An example would be cases of very wet or dry seasons.
- There are different time zones in some countries, which could be used to flatten the demand curve of the region as a whole.
- Collectively, the requirement of reserve margin would be significantly lower than for an individual country, with potential for savings in CAPEX for all countries.
- There is strong potential for inter- country exports with CAPS as well as to countries outside the region. A strong transmission and dispatch system would go a long way to facilitate this aim.
- The thermal plants could be better optimized in operation as well in coordination in the annual maintenance plans.
- An independent dispatch system and regulatory institution with strong regional grid would be very helpful for mitigating part of the credit risk for IPPs developing projects in countries with relatively smaller economies.
- The transmission and generation resources shared across the region would save substantive investments and free scarce investments for critical areas of health, education and other economic development activities.

Worldwide, transboundary (provincial level within a large country or with other countries) electric grids and cooperative agreements are expanding to take advantage of similar market and resource diversity (e.g., West African Power Pool, the Mekong region, Europe and North America, India and China). All these systems have benefited in terms of lowering investments, losses and redundancies, and encouraging electricity trade.

2. Current activity

Recent major projects, which are quite expansive, have been aimed at development of transmission facilities, with focus on optimization from one country context rather than maximization in the regional context. Some small initiatives have been undertaken which support the development of a strong dispatch and regulatory set up in regional context. USAID under the project, Regional Electric Market Assistance Program (REMAP) has supported establishment of CDC. There are plans to provide further assistance through REMAP-II project.

3. Objectives of action plan

The objective would be to support the exploration of potential opportunities to maximize the benefits of unified operation of the CAPS grid to all the participating countries. The tasks will entail moving towards integrated planning of the transmission system on a regional basis, developing institutional capacity and enhancing the role of CDC and countries in regulation of the sector in order to achieve these goals.

¹ Hydro reservoirs would also be required to coordinate with demands of downstream irrigation systems.

4. Core action items

- Participating countries agree on the opportunities for benefits in developing and progressively moving to operate the CAPS as an integrated network through a common dispatch centre and regulatory procedures to support regional power trade on economic principles.
- Donors to fund: preparation of plans for a phased priority investment and implementation plan to strengthen CDC; national dispatch centers; studies to assess country regulatory issues, prepare Grid Code and model contracts, and to define an enhanced role of CDC to enable regional power trade on economic principles.
- Participating countries agree to work collectively to increase the share of regional trade by 50% compared to current levels over the next three years.