Promoting Regional Electricity Trade and Harmonization in Central Asia

14th MEETING OF THE TASK FORCE ON REGIONAL ENERGY COOPERATION IN CENTRAL AND SOUTH ASIA

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Objective and Organization of Presentation

Objective

- **To highlight regional electricity market (REM) benefits, constraints, design and best practices, and suggest next steps for Central Asia (CA)**

Organization of Presentation

- Section 1 – Benefits of Central Asia Regional Electricity Market
- Section 2 – Regional Electricity Market Best Practices
- Section 3 – Suggested Next Steps for Central Asia
- Annex 1: Examples of Regional Electricity Markets

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Section 1
Benefits of Central Asia Regional Electricity Market

Results of Previous Central Asia Regional Electricity Trade Study

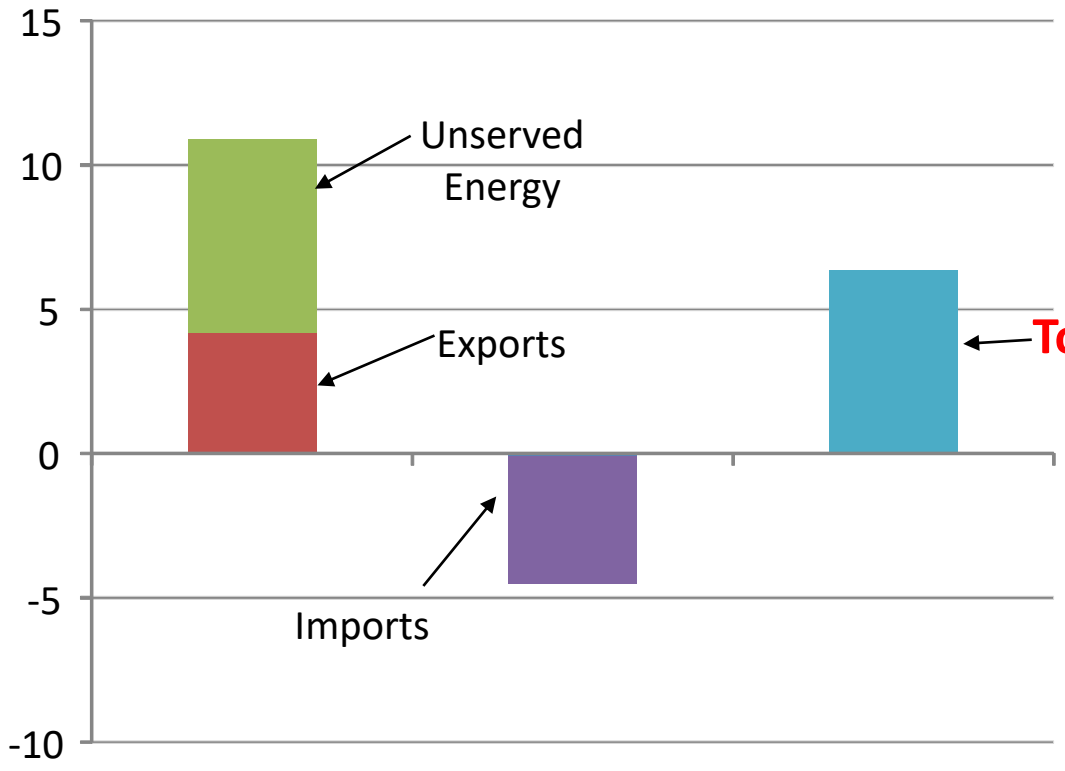
- **A World Bank study reported at April and October 2016 ESCC Meetings determined the aggregated benefits for four Central Asia countries if efficient trade had been pursued during the 2010-2014 period. The study also showed:**
  - How those total benefits might have been distributed among the four countries under different scenarios
  - How those benefits might have changed if fuel prices for generation in the region had been at "export market" levels for cross-border trade, rather than at the levels which had historically prevailed

Benefits of Efficient Trade for 2010-2014
Study Results under Three Main Scenarios

	Benefits from fuel savings only at historic energy prices USD million	Benefits from fuel savings and meeting unserved power demand at historic energy prices USD million	Benefits from fuel savings and meeting unserved power demand at market energy prices USD million
Kazakhstan	249	190	293
Uzbekistan	608	3,226	2,932
Kyrgyzstan	(68)	900	1,813
Tajikistan	699	879	1,316
Total	1,488	5,195	6,354

Benefits of Efficient Trade for 2010-2014 ($US Billion)

(at Export Parity Prices for Fuel and CO2 at US$20/ton)



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Conclusions of the Central Asia Regional Electricity Trade Study

- **Effective regional energy trade in Central Asia can provide significant regional benefits, both monetary and in terms of reductions in energy not supplied**
- **All Central Asian countries benefit**
- **Results robust under broad range of scenarios**

Section 2
Regional Electricity Market (REM) Best Practices

Prerequisites for Functional REM

- **Harmonized regional technical standards with minimum requirements specified in regional grid code**
- **Regional governance structure including institutions, market rules and dispute resolution process**
- **Reciprocity, fair and non-discriminatory – in terms of access to the grid and pricing**

Takes Many Years to Put Effective Regional Energy Market in Place

- **Before a regional electricity market (REM) can be established, there are numerous constraints to eliminate and a common regulatory framework to implement**
- **A staged approach is necessary. For example, the EU reform process has been ongoing for the past 20 years:**
  - First liberalization initiatives adopted in 1996
  - Second liberalization initiatives adopted in 2003
  - Third liberalization initiative adopted in 2009
  - Reform continues to this day as the EU adopts additional resolutions to improve the workings of the Internal Electricity Market
- **Central Asia can benefit from the many lessons learned elsewhere**

Harmonized Regulations

- **To ensure a level playing field, all countries in the REM must be subject to the same minimum regulatory standards, including:**

  - Technical standards – one country must not put at risk the reliability of another. Requires adoption of common grid code

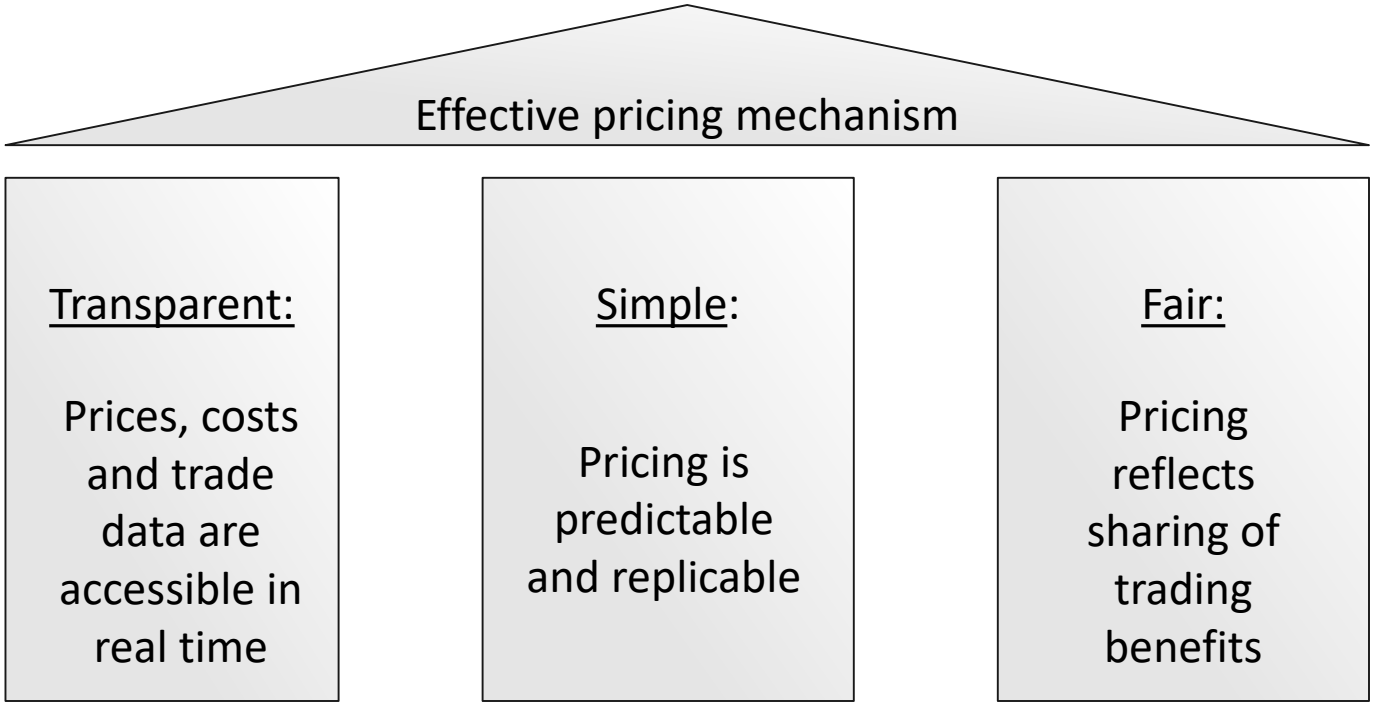
  - Environmental standards – common standards on power plant emissions, renewables, etc.

  - Taxes – taxes on regional transactions should be at an agreed common level

Regional Institutions

- **Regional institutions ensure fair and consistent treatment of all countries in regional market. Normally includes:**
  - Regional Transmission System Operator (TSO) works with national TSOs to ensure open access to the transmission network at prices, terms and conditions applied equally to both national and regional transactions; i.e., ENTSO-E
  - Regional regulator works with national regulators to ensure regulations are applied equally to all countries, guard against market power abuse, levy penalties as necessary and undertake dispute resolution; i.e., ACER

Guiding Principles for Pricing Regional Trades



- **Subsidized fuel inputs to electricity generation discourage trade**
- **Reforms of national energy prices are under way in Central Asia, but will take time to reach economic cost recovery**
- **Domestic subsidies would not be a barrier if regional trade is based on international fuel prices**

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Global REM Experience

- ***A staged approach is necessary for development of regional electricity markets*** – A gradual but consistent and coherent approach to the development of electricity trade and market integration is followed based on consistent long-term strategy that identifies specific policy actions to be undertaken in each stage of market development

- ***There are various levels of regional power integration*** - Types of regional integration are wide-ranging, from simpler forms ***that may include only individual cross-border generation projects, to more advanced forms that may include a combination of unified multinational power markets***, technical and regulatory harmonization, a power exchange, regional coordination of investment and competition across borders

Global REM Experience (continued)

- ***There are efficiencies to be gained under any integration scheme -*** The optimization of generation and transmission operations and investment on a regional rather than national basis offers substantial cost reductions

- ***There is a need to establish regional institutions -*** Regional institutions are vital, but there is no single institutional form that is appropriate for all REM schemes

- ***Technical and regulatory harmonization should be addressed as soon as possible -*** Harmonization of technical standards avoids endangering the reliability of neighboring systems and harmonization of regulations, although not a prerequisite initially, is increasingly required as cross-border competitive power trade develops

- ***There should be a flexible approach to power sector reform -*** Competitive power markets are not a prerequisite for initial regional market integration. Flexibility enhances the prospects for success

Section 3
Suggested Next Steps for Central Asia REM

Suggested Next Steps for Central Asia

- **Establish inter-governmental agreement on development objectives of a REM in Central Asia; i.e., Memorandum of Understanding**

- **Stage 1 – Transition Stage - Expand Opportunities for Regional Trades**
  - **Identify priority infrastructure projects to expand cross-border interconnection capacity**
  - **Expand bilateral and regional electricity trades**
  - **Synchronize transmission networks**
  - **Identify responsibilities of Regional TSO and expand/equip CDC Energia to perform this role**

- **Stage 2 – Develop Regional Electricity Market Design and Functions**
  - **Develop regulatory structure and framework for transmission access and pricing**
  - **Develop Regional Grid Code and Regional Market Rules**
  - **Develop regional regulatory entity with regional market oversight responsibilities and representation from participating Central Asian countries**

THANK YOU



Annex 1
Examples of Regional Electricity Market

REM Example – SIEPAC (Central America)



- Six Central American countries—Guatemala, El Salvador, Honduras, Costa Rica, Nicaragua, and Panama— created the Central American Electrical Interconnection System (SIEPAC), an integrated REM, to expand international trade
- SIEPAC generates efficiency gains through economic dispatch on the broader regional level as well as shared reserves
- Enables large-scale hydropower development in the broader regional market, which potentially includes neighboring systems in Mexico and Colombia

SIEPAC – Overview (continued)

- **Market structures among the six countries vary from fully competitive wholesale markets to monopoly vertically-integrated utilities acting as single buyers**

- **Some countries have significant private sector participation in their power sectors, while others are limited to independent power producers (IPPs)**

- **All countries have cross-subsidization in their tariff structures**

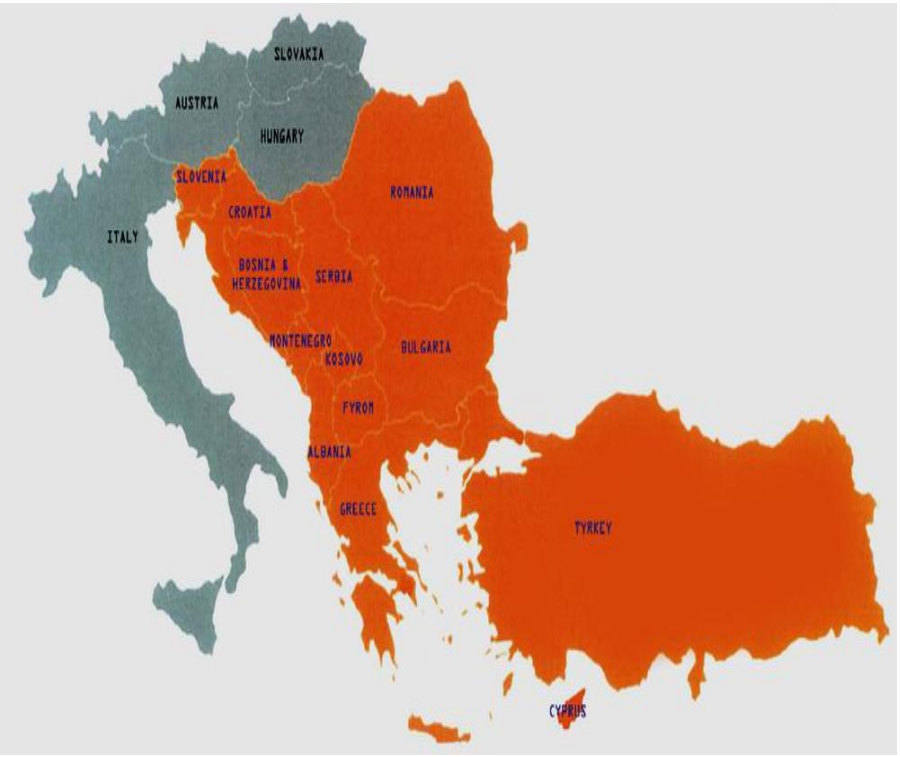
SIEPAC - Regulatory

- **Intergovernmental framework agreement known as the Marco Treaty signed in 1996 and came into effect in 1999**
- **Treaty provides the legal basis for the regional market and supporting institutional and physical infrastructure**
- **The REM is designed as a seventh market that operates on top of the six national markets, connecting the national markets while remaining separate**
- **Design allows individual countries to develop at their own pace while enabling trade at the regional level**

SIEPAC - Institutional

- **Includes a regional regulator and a regional transmission system operator identified in the Marco Treaty**
- **The REM took two years to develop before being approved by the six governments in 2000**
- **The regional regulator and TSO have supranational legal status, granting them independence from the six national legal systems**
- **REM governed by Market Rules on top of trade in the national markets**

REM Example – South-East Europe (SEE)



- **Combined with the potential for future European Union (EU) membership, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Montenegro, Romania, Serbia, and the EU signed the treaty establishing the Energy Community in 2005**

- **A study determined that the least-cost investment in generation and transmission in SEE would save €3 billion between 2005 and 2020**

- **Investment savings substantial due to growing demand and need to replace old and inefficient generation and transmission infrastructure**

SEE – Overview (continued)

- **Many of the countries are small and only able to reap economies of scale through exports to a broader regional market**

- **Power exports provide significant source of revenue in some countries**

- **SEE countries benefit from enhanced security of supply and economic efficiencies from cross-border trade**

SEE - Regulatory

- **The treaty establishing the Energy Community was the Thessaloniki Declaration in 1999**

- **Replaced by the Athens Memorandum of 2002. Includes detailed blueprint of what each party must do to prepare for a regional market, and an approximate timetable**

- **A legally binding agreement, the Energy Community Treaty, was signed in Athens in October 2005 and came into force in July 2006**

SEE – Institutional

- **The primary features of the REM include:**
  - Competition, over time, in wholesale and retail supply
  - A common regulatory framework with independent national regulators
  - Unbundling of previously vertically integrated utilities with functionally and financially unbundled TSOs
  - Establishment of a regionally integrated network linked to the wider EU network with common set of governance rules
  - Coordination of regional planning and facilitation of competition
  - The Energy Community Regulatory Board settles cross-border disputes and advises on statutory technical and regulatory rules