CENTRAL ASIA REGIONAL ELECTRICITY TRADE AND MARKET DEVELOPMENT OVERVIEW

The World Bank CAREC ESCC meeting presentation

SEP, 2018

Mitsunori Motohashi: World Bank Senior Energy Specialist
Husam Beides: World Bank Lead Energy Specialist
Debabrata Chattopadhyay: World Bank Senior Energy Specialist
Donghui Park: World Bank Energy Consultant

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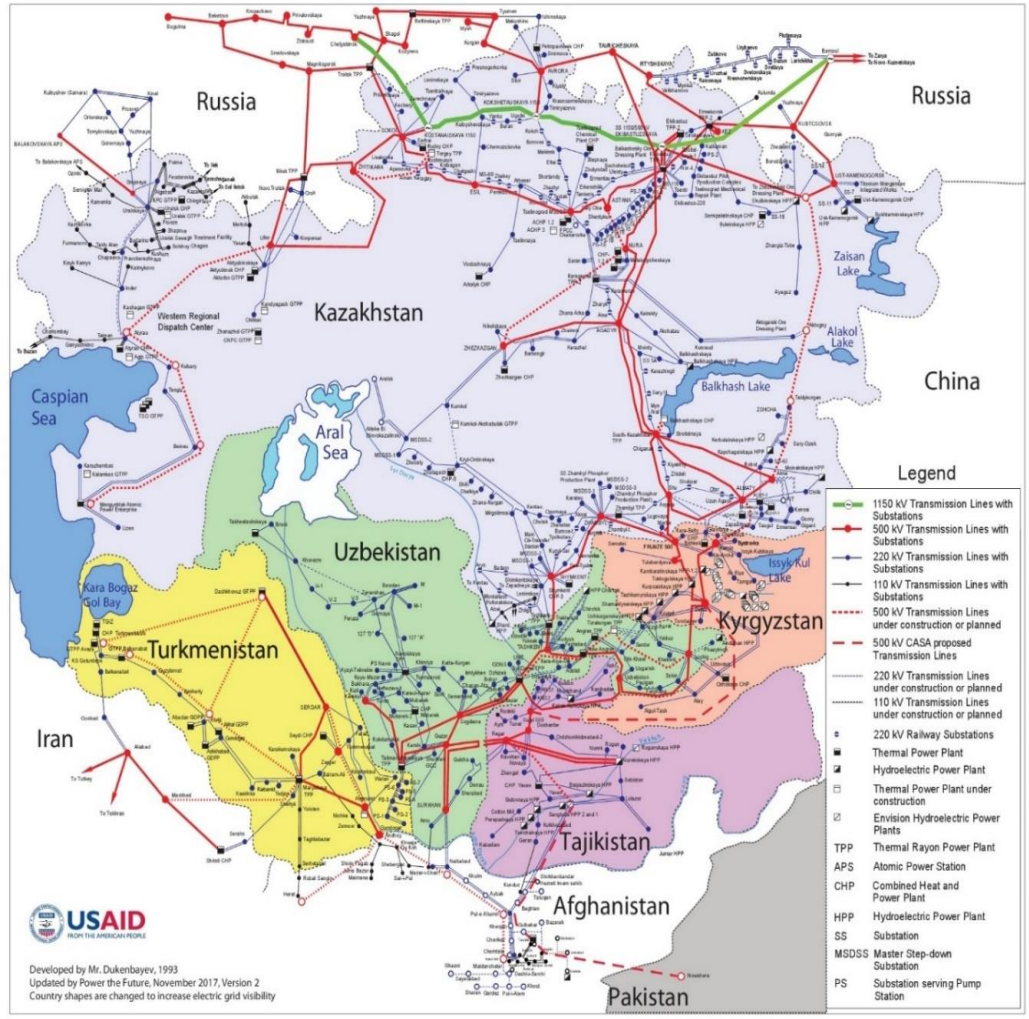
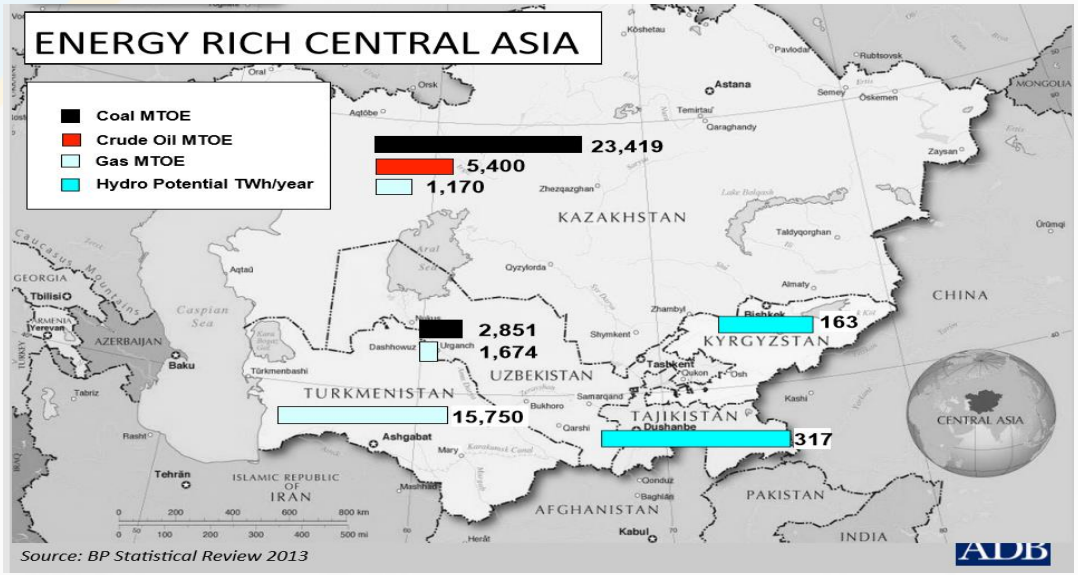
Current State of Central Asia Electricity Market Integration



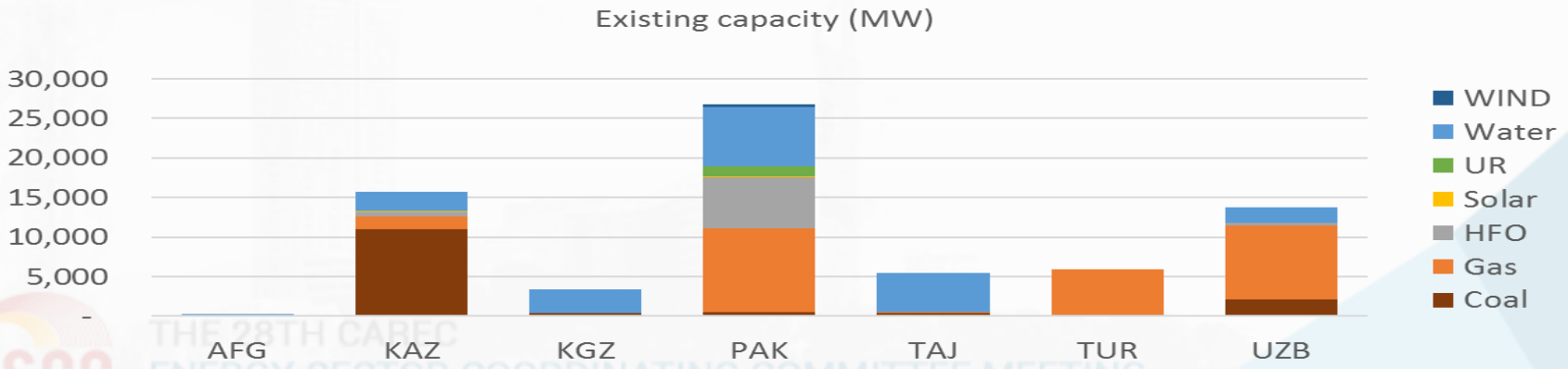
Regional Market Integration Issues

- Existing trade is below interconnection capacity
- Lack of coordination in generation economic dispatch and regional network management and planning
- Synchronization is limited currently (KZ, KYR, UZ) – to be expanded with TJ and potential with Afghanistan
- Very limited connectivity between Central Asia and South Asia
- Increase potential of trade with implementation of CASA 1000 and TUTAP

Rational for the Central Asia and South Asia Regional Integration



Regional integration cost benefits arise from trade between comparatively energy rich Central Asia (Hydro in KGZ and TAJ, Coal in KAZ, Gas in KAZ and TUR, UZB) and energy poor South Asia (high demand growth in AFG and PAK, limited domestic fossil fuels)



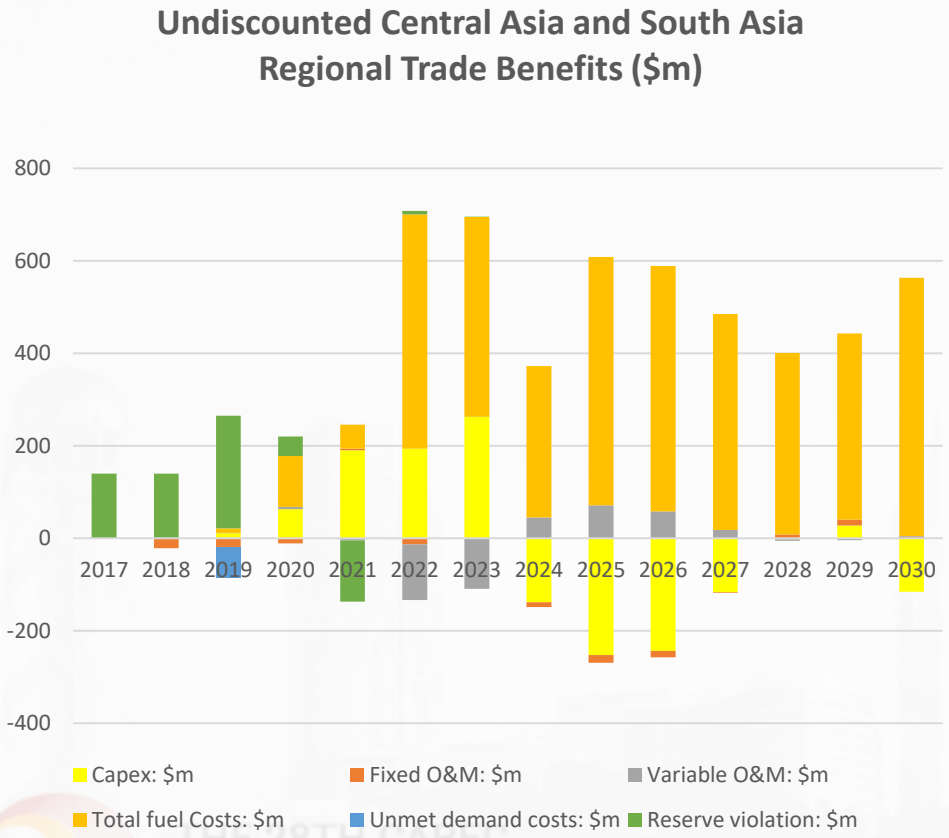
Rational for the Central Asia and South Asia Regional Integration

System Benefits of Central Asia and South Asia Market Integration

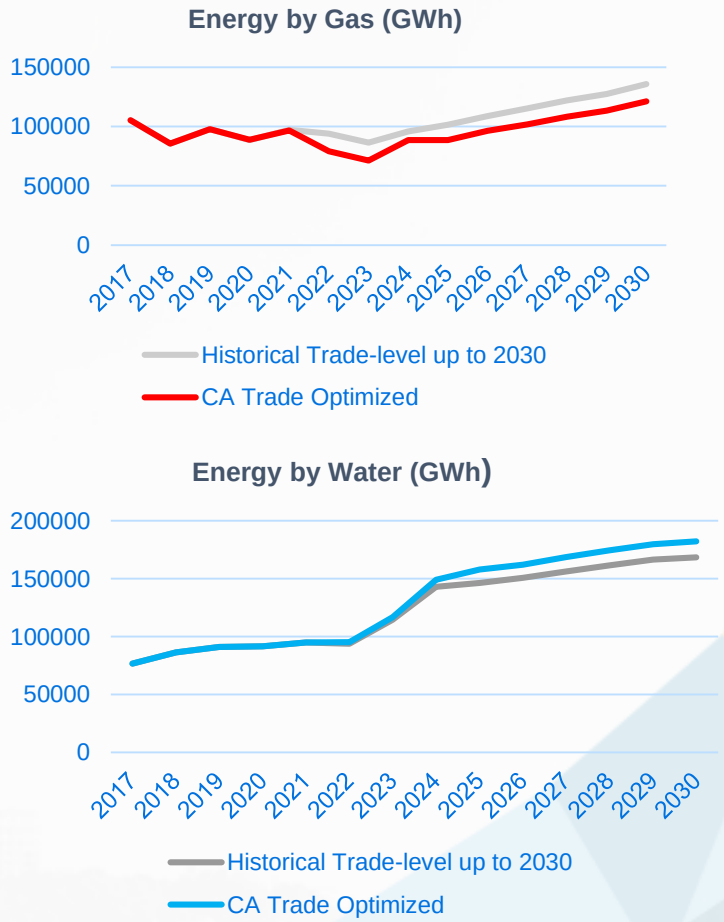
- Major savings can arise from fuel cost savings, the integration allows countries to substitute peak load dispatch (majorly Gas, HFO and LNG as well) for base load generation (Hydro)
  - ✓ Better exploitation of existing and planned hydro power plants
  - ✓ More Hydro capacity and optimized development of thermal power plants through regional integration
- Capital cost savings despite the shift from lower-capex technology (Gas) to Hydro because new investments delayed
  - ✓ New investments delayed because of higher generation of existing and committed plants over the time horizon (2018-2030) except for Gas and Renewables

Rational for the Central Asia and South Asia Regional Integration

System Cost Difference between Historical Trade-level up to 2030 Scenario and Central Asia Market Integration with CASA-1000 Scenario



Base Load Plants Substitute for Peak Load Plants



** Preliminary Results from the World Bank Regional Power System Planning Study*

World Bank New ASA (Central Asia Regional Electricity Trade and Market Development)

Improving Connectivity and Regional Electricity Market Development

- **Phase 1 activities : assessment of Central Asia regional power system and trade opportunities**
  - ✓ Review and assess country energy demand and resources, including electricity sector expansion plans for Central Asia countries and relevant neighboring countries
  - ✓ Examine potential of electricity trade among Central Asian countries and with neighboring countries in South Asia (mainly Afghanistan and Pakistan) and other countries such as China with prospect of trade with Central Asia
  - ✓ Identify transmission interconnection upgrades and potential new cross-border transmission projects that will be necessary to support economic electricity trade in Central Asia
  - ✓ Support Central Asian countries in developing financial, commercial, and implementational frameworks for potential cross-border electricity trade in the region

Phase 1 Activity: Regional Power System Planning Analysis Structure

Sector Planning and Market Integration Scenarios 2018–2030

Scenario 1. Historical trade level (2016) would remain until 2030 (reserve trade only allowed within a country)

Scenario 2. Trade optimized within Central Asia countries over existing and committed transmission lines (reserve trade allowed between countries)

Scenario 3. Together with Central Asia market integration, CASA/TUTAP are operational

Scenario 4. Together with CASA/TUTAP integration, trade opportunities with other neighboring countries/regions such as China would be assessed

More trade and integration leads to less total system planning cost (NPV)

World Bank New ASA (Central Asia Regional Electricity Trade and Market Development)

Improving Connectivity and Regional Electricity Market Development

- **Phase 2 activities : assessment of barriers for development of regional electricity markets in Central Asia and guidance to the regional market integration**
  - ✓ Review the legal, institutional, regulatory and pricing framework of the electricity sectors of Central Asia countries and other targeted countries, with the focus on cross-border electricity trade
  - ✓ Assess potential barriers for the Central Asia regional market integration, provide recommendations and consultations for the market integration
  - ✓ Conduct stakeholder analysis and develop communication strategies to facilitate constructive dialogues with regional stakeholders
  - ✓ Develop Central Asia regional market integration framework/roadmap and action plan with the goal of expanding bilateral and regional electricity trade and transitioning toward a competitive and efficient regional electricity market

CONTACT INFORMATION

HUSAM BEIDES: HBEIDES@WORLDBANK.ORG

DEBABRATA CHATTOPADHYAY: DCHATTOPADHYAY@WORLDBANK.ORG

MITSUNORI MOTOHASHI: MMOTOHASHI@WORLDBANK.ORG

DONGHUI PARK: DPARK2@WORLDBANK.ORG