

# **ESCC Action Plan: Energy-Water Linkages**

**CAREC-ESCC Meeting  
Almaty, Kazakhstan  
September 2/3, 2009**

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# Core Issues

## **1. Energy Demand/Supply Balance and Infrastructure constraints**

- Support most efficient use of energy resources across the region
- Examine such factors as renewable energy, efficiency and demand side management, intra-regional and extra-regional trade opportunities
- Consider seasonal supply/demand balances and any transmission constraints

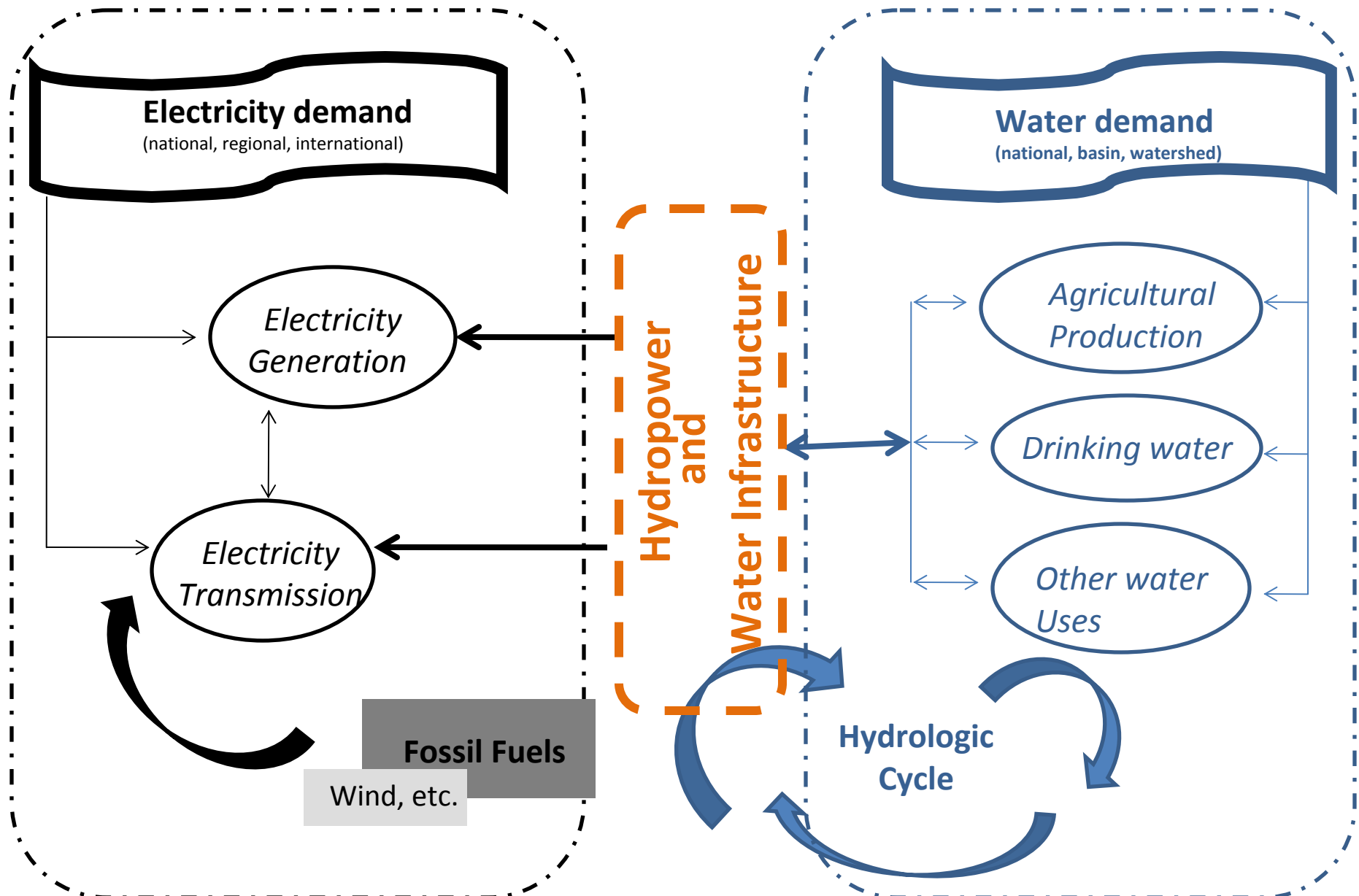
## **2. Dispatch and Regulatory Aspects**

- Accelerate sector restructuring, regulation, and contractual arrangements (i.e., commercialization)
- Cover policy, institutional and infrastructure needs to facilitate trade and efficient transit of energy across the region
- Focus on electricity sector

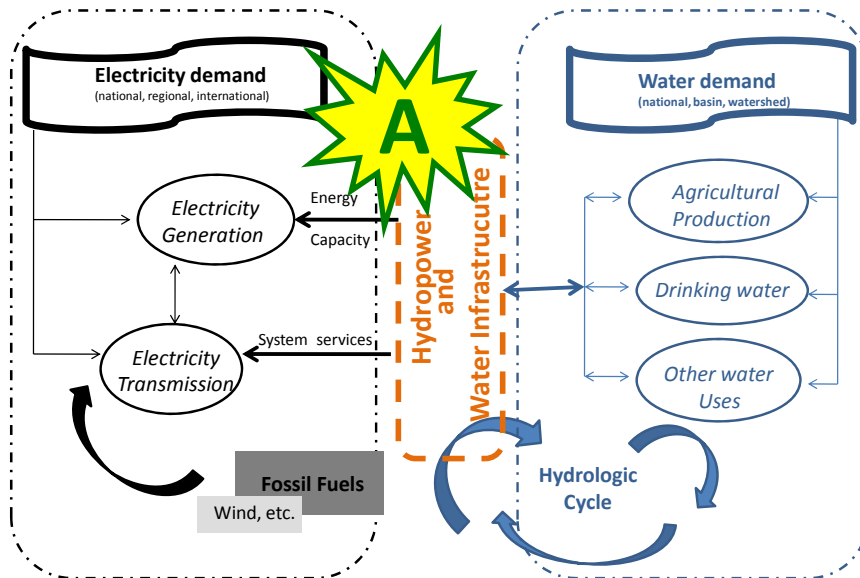
## **3. Energy-Water Linkages**

- Recognize hydropower as a valuable dimension to the region's energy assets
- Address the particular distribution of hydropower resources in Central Asia and the attendant complexities of transboundary water management
- Focus on strengthening the analytical base to facilitate dialogue and coordinated management of energy and water resources

# Schematic of Energy-Water Linkages



## Schematic of Energy-Water Linkages

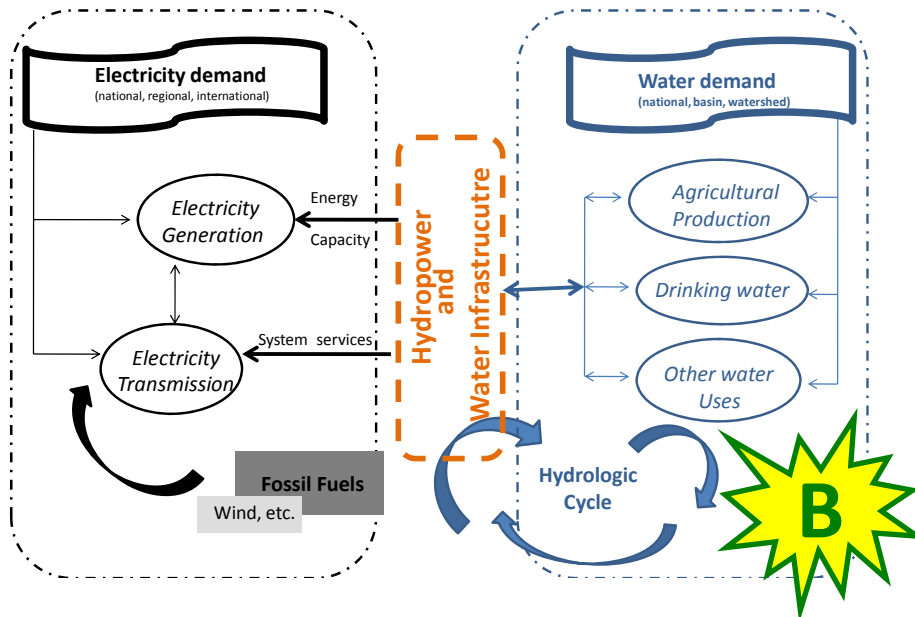


# The Role of Hydropower in an Optimal Energy Mix

- ❖ Hydropower provides energy and capacity AND
    - ❖ Load following/Peaking
    - ❖ System (Ancillary) services (e.g., black start, spinning reserve)
  - ❖ If base load is secure, hydropower can contribute low cost peaking power
- ➔ Energy-water linkages means: ***exploiting hydropower's differentiated product***

- ❖ Examples
  - ❖ Powerex, Canada
  - ❖ HydroTasmania

## Schematic of Energy-Water Linkages



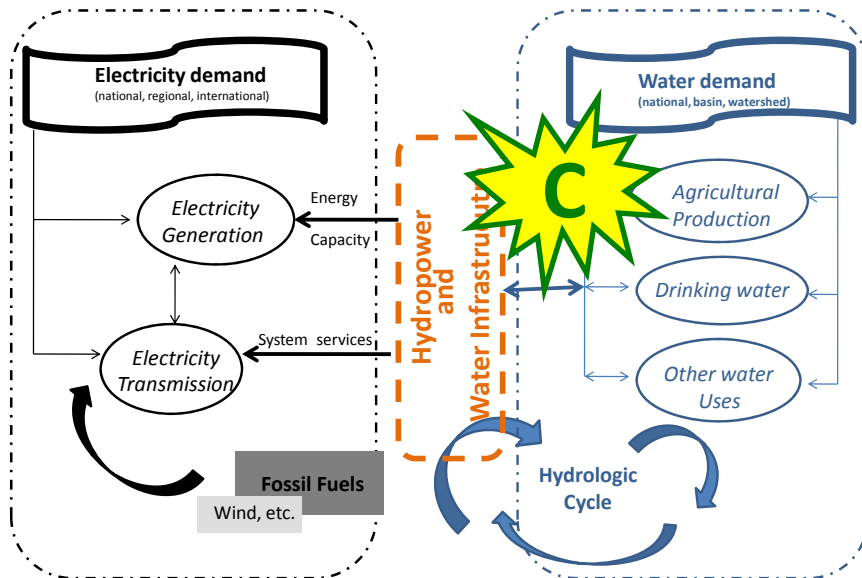
# The Challenges of Variable Fuel Supply

- ❖ Fossil fuels can be contracted with some certainty; Water is variable in time, place and volume of delivery → Operating decisions are made under uncertainty
- ❖ Climate change will affect both average flows and variability; changes are dynamic (“stationarity is dead”) BUT hydropower can be both a mitigation and adaptation measure in response to climate change
- Energy-water linkages means: ***understanding and managing variability*** (e.g., forecasting, system planning, infrastructure design, climate change)

### ❖ Examples

- ❖ Brazil
- ❖ Albania or Nile equatorial lakes

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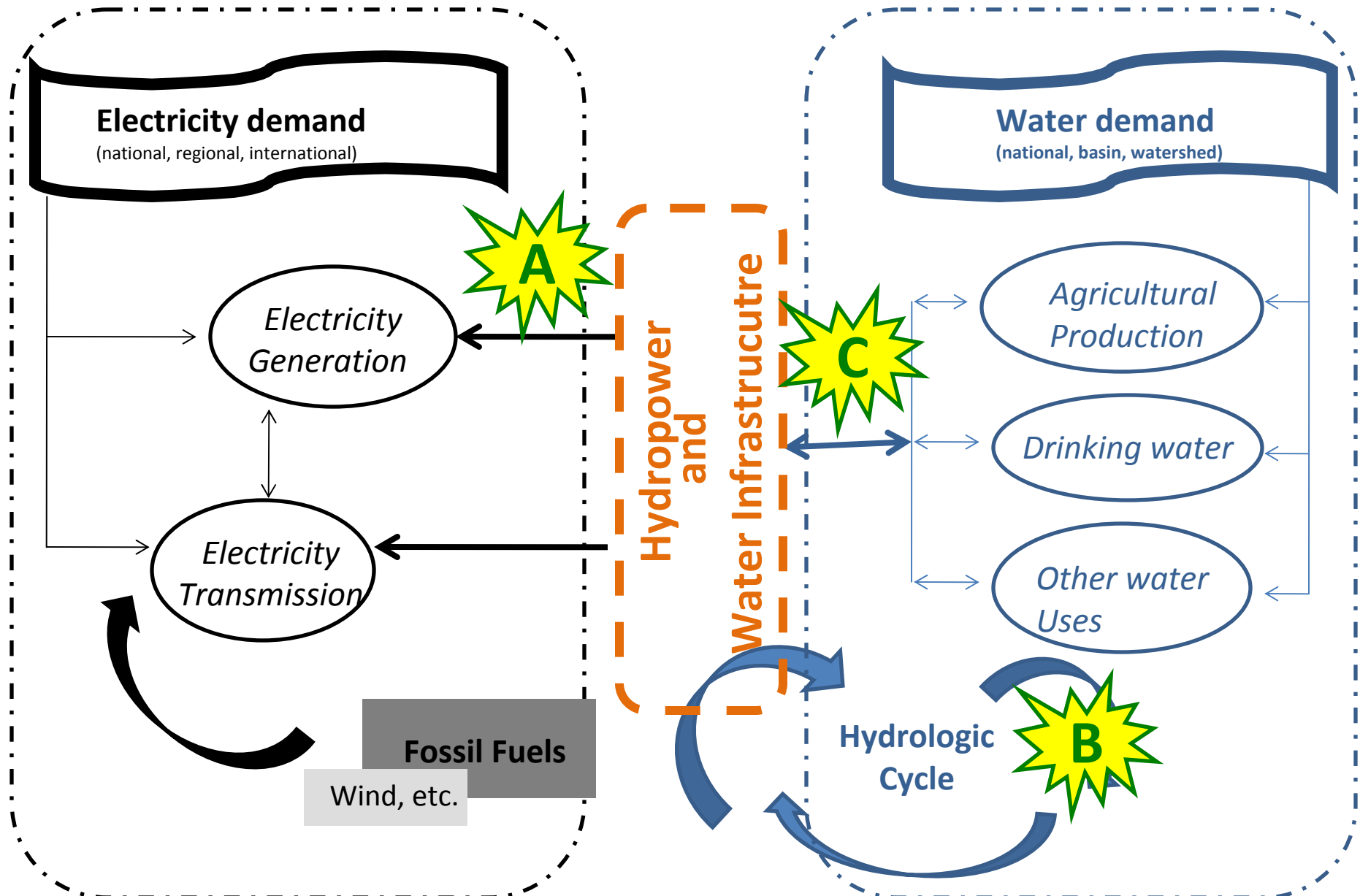
Water infrastructure  
is inherently  
“multi-purpose”

- ❖ Allocation of fossil fuels is determined in a global energy market; Water has no such market. Some values cannot be accurately priced and, generally, we have a very poor understanding of the value of water to the economy. Hence, prices and markets won't adequately allocate water.
- ❖ Investments in *either* sector have feedback impacts to the other

❖ Energy-water linkages means: ***understanding and basing investment decisions on the economic value of water in both sectors (joint optimization)***

- ❖ Examples
  - ❖ Blue Nile evapotranspiration
  - ❖ Reoperations in the U.S. and Canada

# Schematic of Energy-Water Linkages



# Implications for Central Asia Energy

## *Continue build on the current knowledge base*

- ❖ Connect energy and water modeling
- ❖ Ensure sufficient confidence and transparency in data and analysis
  - ❖ Tightly link the process of analysis and dialogue
- ❖ Seek investment opportunities to optimize across both sectors



# Energy Action Plan: Core Action Items

## Objective of the Energy-Water component:

To strengthen cooperation by integrating energy and water analysis

## Actions

1. Enhance integrated models, analytical tools and shared databases that enable assessment of options and impacts across both sectors [*Capacity building*]
2. Strengthen Central Asia institutions (such as IFAS and CDC) as regional centres of excellence for data sharing, analysis and modeling, and dialogue [*Policy environment and institutions*]
3. Identify consensus projects and investments in both sectors to improve cross-sectoral management [*Investments*]

Questions?  
Comments?  
Suggestions?

*SPASIBA*