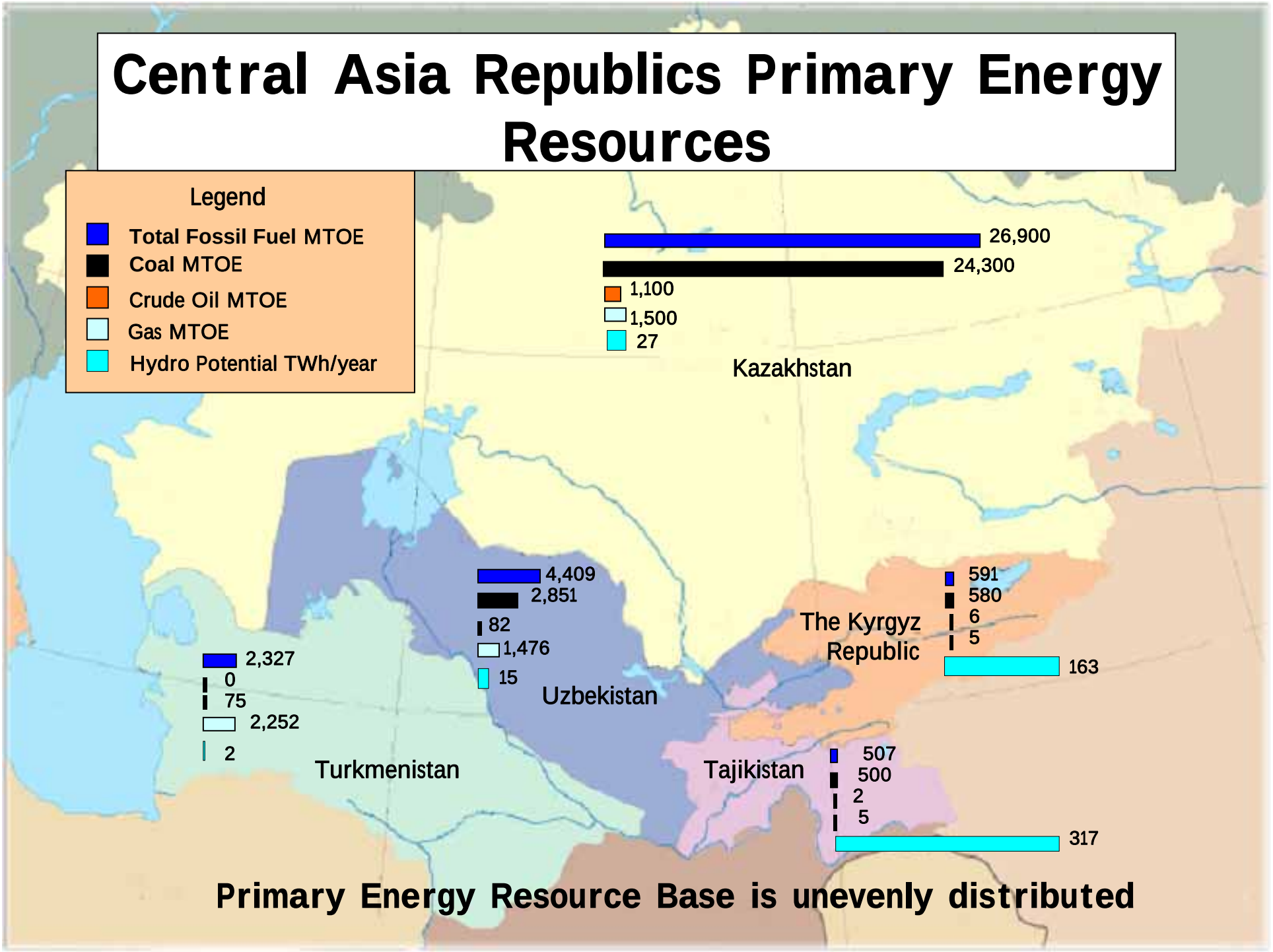
Central Asia
Water and Energy Nexus

Central Asia Republics Primary Energy Resources



Primary Energy Resource Base is unevenly distributed

Based on these resources, integrated electricity, gas and irrigation systems were developed,under a single political entity, the Soviet Union

After Independence, the Central Asian Republics pursued a policy of Self-Sufficiency in energy (among other things)

However, regional inter-dependence continued, but with different terms

Regional Inter-Dependence

Consumer

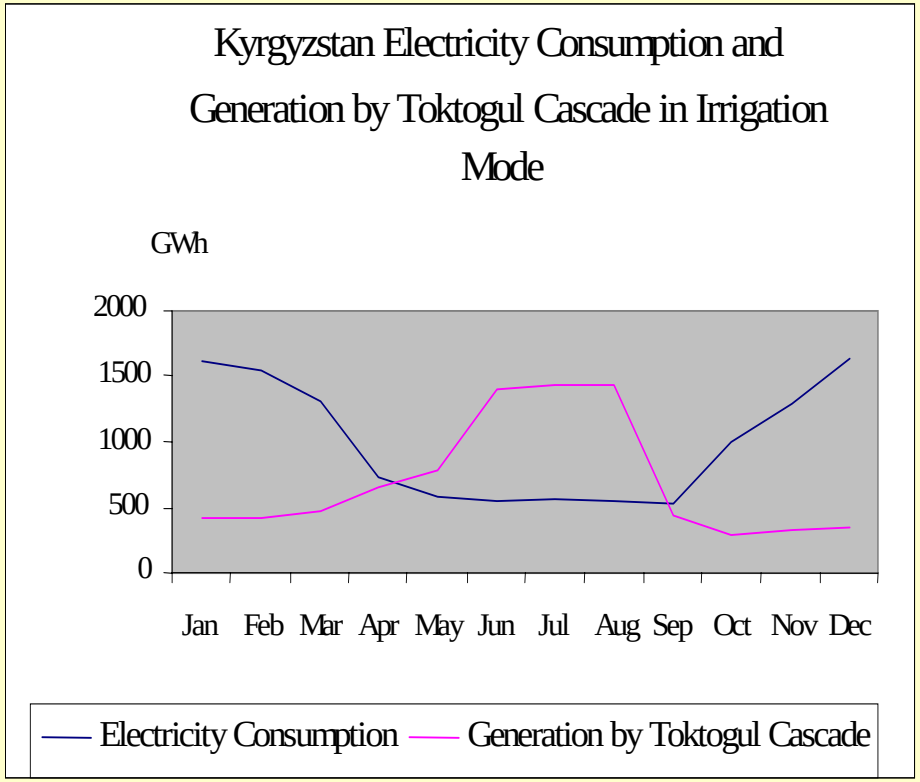
Supplier

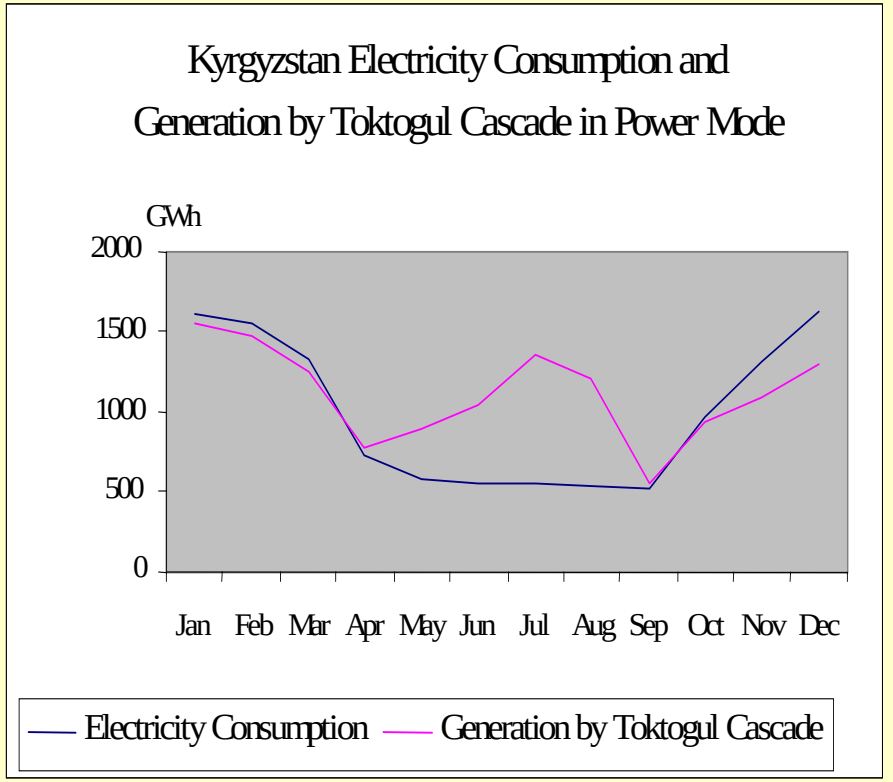
	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmen	Uzbekistan
Kazakhstan	--	Coal			
Kyrgyz Republic	Water	--	Electricity		Water
Tajikistan		Electricity	--		Water Gas and Rail Transit
Turkmen			Electricity	--	
Uzbekistan	Gas	Gas	Electricity Gas		--

Terms of exchange changed drastically from Soviet times

e.g., Kyrgyz and Tajik had to pay for fossil fuels in hard currency

Terms of Exchange had negative impact on water-energy balance





Recognition of Inter-Dependence

- By late 1990s, the need for continued inter-dependence was recognized
  - Integrated power system, with central load dispatch in Tashkent
  - 93% of Uzbekistan's waters come from outside the country
    - Ensuring such water supply for the vegetation season was a priority
  - Neighbors continue to account for a significant share of Uzbek gas exports
  - The best coal supply option for Bishkek CHP is Karaganda (Kazakh) coal

Accordingly a Framework Agreement was entered into in 1998

Tajikistan joined the Agreement in 1999

The 1998 Framework Agreement for the Syr Darya Basin

- Recognizes the energy losses by upstream country for irrigation operation of Toktogul and Kairakkum
- Confirms compensation for such losses including in cash
- Requires annual agreements for water energy exchange quantities, prices etc.
- In itself, a considerable achievement
- But how has it worked?

The 1998 Framework Agreement for the Syr Darya Basin

- It works, but not very well
  - The annual negotiations take a long time
  - The timing difference of resource exchange creates a problem
  - Does not accommodate the variations in hydrology
  - Barter exchanges does not help anybody, in view of the inconsistent nature of pricing etc.
    - Kyrgyz electricity price/kWh to Kazakh is 1 US cent; whereas it is 3.34 US cent to Uzbek
    - Tajik electricity price to Uzbek is 1.43 kWh;
    - Uzbek electricity price to Tajik is 2.5 US cents/kWh
  - Dispute resolution, while contemplated, not implemented

A Solution to the Problems of Water and Energy Nexus Problem

- **Modify the 1998 Framework Agreement to ensure better implementation**
  - **Monetise the payments (Articles II, IV and X)**
  - **Payment for Water Services (Article IV)**
  - **Unify tariffs (Article IV)**
  - **Make payment in fixed and variable portion**
  - **Multiyear Agreement**
  - **Conflict Resolution (Article IX – needs strengthening)**
  - **Enforcement (Article V)**

Is Payment for Water Services Acceptable?

- International Experience
  - shows that 44 of the 260+ transboundary freshwater agreements have downstream countries sharing the benefits with upstream
  - Lesotho Highlands Water Project – Republic of South Africa pays an annual royalty, services the debt of the project; and all electricity is used by Lesotho
  - Within the region itself – Kyrgyz and Kazakh have entered into the Chu Talas River Agreement

Issues

- Revising the Agreement is fine but enforcement would be a big issue
- To help build confidence and ensure compliance
  - A third party involvement and an instrument is needed as contemplated by Article V

WATER-ENERGY CONSORTIUM: WHAT FORM COULD IT TAKE ?

INTENSITY OF REGIONAL COOPERATION / INTEGRATION

1	2	3	4
A Forum for Discussion of Water-Energy Trade Issues ?	A Group of National Experts Empowered by their Governments to Sign Inter-Governmental Agreements on Water & Energy Trade ?	An International (i.e. multi-country) JSC that Operates the Nationally-owned Assets associated with Water & Energy Trade ?	An International Holding that Owns and Operates the Assets associated with Water & Energy Trade in the Different Countries ?
Coordinate national and/or internationally-funded research / analysis on issues of mutual interest (water-energy exchanges, harmonization of legal framework and regulatory practices, new investments projects) Seek financing for projects of regional significance Debate possible solutions at the technical level and tries to reach consensus Present recommendations for each National Government to consider and act upon	**In addition to (1):** Negotiate and sign Inter-Governmental Agreement(s) on water-energy trade Monitor implementation by the parties Report to individual governments on breaches, if any, of the signed agreements for individual governments to take appropriate actions	Operates the assets according to regionally agreed rules (water flows and power plants) Negotiate and sign national and international fuel purchases and power sales / power transmission agreements Finance operation and maintenance of existing assets Prepare detailed feasibility studies for rehabilitation and new investment for consideration by the owners of the assets	**In addition to (3):** Decides on least-cost regional investment policy and on individual projects in the countries concerned Finance, including through borrowing in its own corporate name, investments in existing and in new assets Owns and operates the new assets

Possible evolution over time ?