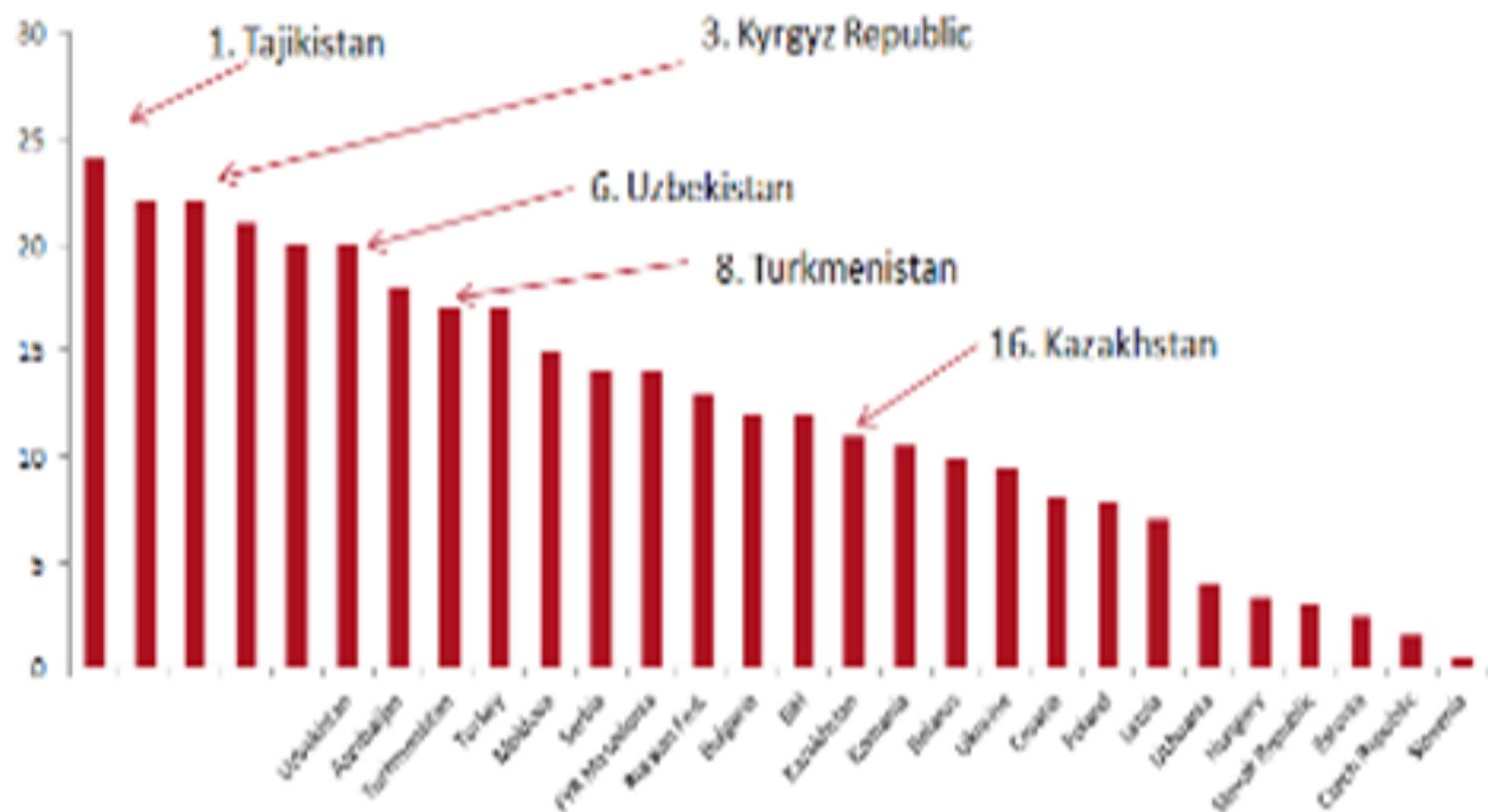


ENERGY VULNERABILITY TO CLIMATE CHANGE: Background and Work Program

A country-level study in Tajikistan
and a regional study in Central Asia

Daryl Fields, World Bank

Simplified Index of Vulnerability to Climate Change



Source: "Economics of Adaptation to Climate Change," World Bank, 2010.

Project Approach and Progress

- Country level studies
 - KAZ, UZB, TURK, and KYG country-level analyses completed (World Bank and EC-IFAS/USAID)
 - TAJ country-level study to complete national perspectives
 - Global attention to (i) energy policy in the context of climate change; and (ii) energy-water linkages
- Regional level study
 - Exploring “externalities” of national actions -- evaluating how actions in one country may have positive or negative consequences across the border(s)

Main risks from 4-country studies

1. Unmanaged climate change impacts on energy sectors (supply and demand) affect countries' economic
2. Increased air temperature – higher transmission and distribution losses
3. Increased extreme climate-related events – intense precipitation, flooding, mudflows, GLOFs, landslides – damage to transmission systems
4. In Kazakhstan and Turkmenistan, in case of increased Caspian Sea level, storm surges can damage onshore and offshore oil and gas production facilities



Main risks from 4-country studies

5. Increased risk of competition between water users:

- In shared river basins
- Between and energy and agriculture

6. Decreased water resource availability affects power production:

- Cooling water availability for TPPs
- Reduced HPP output



In summary, increased supply-demand imbalance due to climate change can affect energy security

Common messages for increasing climate resilience

- Improved demand management
- Improved efficiency of energy generation and T&D
- Diversification of energy supply

- Improved water management

- Regional coordination
 - Exploiting economies
 - Avoiding conflicting actions



Project Activities

Country-level study in Tajikistan	Regional study
Updating understanding of climate change-induced hydrology	
analysis of climate risks in the energy sector	analysis of risks across the region
assessment of the impacts on energy supply, demand, investment and other sectors	assessment of regional externalities of country-level adaptation measures
proposals for measures to strengthen resilience and adaptability of the energy sector	development of priority actions and recommendations for regional coordination on energy sector adaptation
expanding dialogue among broader community of energy sector professionals	initiating a regional dialogue among specialists from the five Central Asia countries