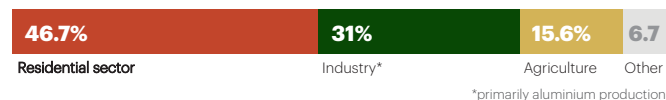


## Tajikistan's Power System

Tajikistan's electricity sector is characterised by **seasonal surpluses and shortages** with limited diversity of energy sources, and the financial challenges of the state-owned electric utility.

- ▶ In 2019, **93% of generation came from hydroelectric power.**
- ▶ Between 2010 and 2018, Tajikistan's GDP grew by **73%**, resulting in an increase of **48% in total final energy consumption.**

### % of Electricity Demand

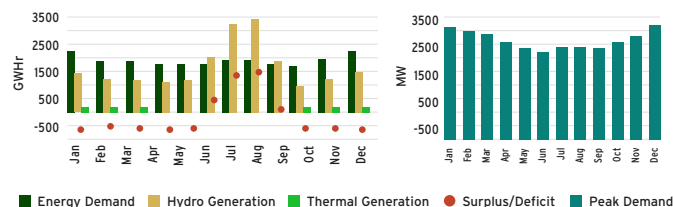


## Challenges

### Seasonal Challenges

Tajikistan has limited sources for heat other than electricity, thereby aggravating winter peak demand causing supply deficits.

### Monthly Energy Balance + Peak Demand in the Tajik Power System, 2015

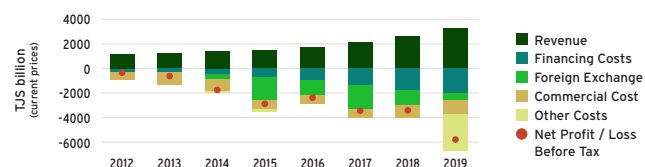


Source: MEWR. (2017). Power Sector Development "Master Plan Vol 1."

### Challenges in Generating New Capacity

Limited private sector participation and challenges in raising capital caused by lack of cost recovery of the main electric utility, Barki Tojik, impede development of new generation capacity.

### Financial performance of Barki Tojik, 2012 - 2019



Note: Other costs include inventory, disposal of property, plant and equipment, and revaluation of fixed assets. Source: OHSC Barki Tojik. (2020). Audit reports.

### Challenges in Lack of Trade Opportunities

Limited access to trade hinders Tajikistan from maximising resource revenue which could help improve the finances of the utility.

## A Vision for 2030

ACTION	CATEGORY	2021	2022	2023	2024	2025	2030
<b>Ensuring Favourable Conditions to Enable Multilateral Electricity Trade</b>							
Progress power sector reforms	Policy + Strategy						
Enhance capacity for optimal dispatch in a regional market	Technology + Operations						
<b>Adopt Multilateral Market Models to Expand Electricity Trade</b>							
Complete reconnection of Tajikistan with the Central Asian Power System	Infrastructure						
Develop minimum political, technical, and institutional requirements for a more flexible multilateral market	Policy + Strategy						
Assess the feasibility of inclusion of Afghanistan in the multilateral market	Policy + Strategy						
Completion of CASA-1000 transmission project	Infrastructure						
Develop minimum political requirements for a more flexible multilateral market	Policy + Strategy						
Assess transmission system requirements and options for expansion	Policy + Strategy						
Assess the possibility of integrating Central Asia and CASA-1000 markets	Policy + Strategy						
<b>Strengthen Tajikistan's Role as a Flexibility Provider for the Region</b>							
Enhance capacity to optimise hydro operation in different markets	Policy + Strategy						
Undertake refurbishments to adapt to increasing flexibility needs	Technology + Operations						

### An extended set of policy recommendations is included in the full roadmap

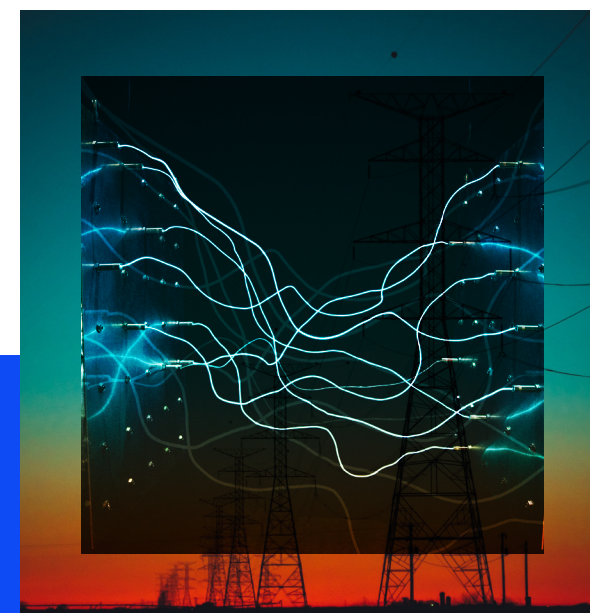


Co-Funded by the European Union

This publication has been produced with the financial assistance of the European Union and is part of the EU4Energy programme. This publication reflects the views of the International Energy Agency (IEA) Secretariat but does not necessarily reflect those of individual IEA member countries or the European Union. The IEA makes no representation or warranty, express or implied, in respect to the publication's contents (including its completeness or accuracy) and shall not be responsible for any use of, or reliance on, the publication. EU4Energy is a collaboration between the IEA, the European Union, Focus Countries and other implementing parties, designed to support the aspirations of Focus Countries to implement sustainable energy policies and foster co-operative energy sector development at the regional level.



# Cross-Border Electricity Trading for Tajikistan: A Roadmap



Discover Tajikistan's potential to create lasting multilateral trade with neighbouring countries.

Experience the full roadmap at  
[iea.org/programmes/eu4energy](https://iea.org/programmes/eu4energy)

# Opportunities

## Cross-Border Electricity Trade

Cross-border trading of electricity helps optimise the resource usage and increase electricity security. Certain conditions could make trade with different countries more suitable in the near or long term.

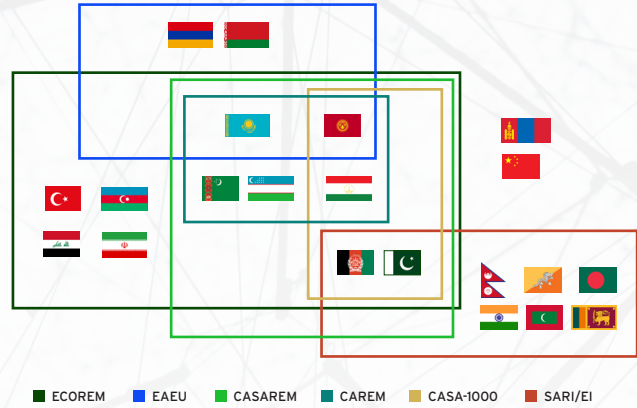
### Favoring Conditions

- + **Demand and supply patterns** are favourable if they are complementary to Tajikistan's summer surpluses and winter shortages. The availability of generation resources that match Tajikistan's needs also support favourable demand and supply patterns.
- + **A high prevailing cost of generation** increases the favourability for exports, whereas a **low prevailing cost** of generation allows for opportunity for imports.
- + **Infrastructure requirements** can prolong the commencement of trading.

### Trading Options in Neighbouring Countries

	Central Asia	Pakistan	Afghanistan	People's Republic of China	Iran/Iraq	India
Demand + Supply Patterns	Similar seasonal demand pattern but with variation in resources + generation technologies	High summer demand	Similar seasonal demand pattern but with growing base demand	Similar seasonal demand pattern but with high levels of variable renewable energy	High summer demand	High summer demand
Cost of Generation	Varying costs of generation by country	High cost of generation	High cost of generation	Low cost of domestic generation	Low cost of domestic generation	High cost of generation
Infrastructure Requirements	Existing network inter-connection	Upcoming inter-connection	Existing inter-connection but with lack of centralised domestic grid + issues with synchronisation	No existing inter-connection	No direct border; wheeling requires synchronisation	No direct border + no existing inter-connection
Outcome	Multilateral trade	1) Flexible trading 2) Export increase	Export increase	Wheeling + balancing imports	Export	Export
Timing	Near term	1) Near term 2) Long term	Long term	Long term	Long term	Long Term

## Regional Electricity Market Initiatives in the Central, South, West Asian and Eurasian Regions



Note: ECOREM = Economic Cooperation Organization Regional Electricity Market; EAEU = Eurasian Economic Union; CASAREM = Central Asia South Asia Regional Energy Markets; CAREM = Central Asia Regional Electricity Market; CASA = Central Asia South Asia; SARI/EI = South Asia Regional Initiative for Energy Integration.

Several initiatives aim to progress regional electricity market integration, giving Tajikistan opportunities to use surplus hydropower and flexibility services. Considering Tajikistan's objectives and power sector conditions, the IEA recommends a roadmap based on three key points

- ▶ **Ensure favourable conditions** to enable multilateral electricity trade
- ▶ **Adopt multilateral market models** to expand electricity trade
- ▶ **Strengthen** Tajikistan's role as a **flexibility provider** for the region

## Develop, Expand, Strengthen

### Ensure Favourable Conditions to Enable Multilateral Electricity Trade

#### Key Actions

- + Improve financial viability and governance in the utilities by sustaining on-going reforms and formalising coordination with important stakeholders.
- + Increase transparency by developing open access for key data such as supply, demand, and transmission data.
- + Strengthen regulatory authorities through training and capacity building, increasing independence, and legislating reporting requirements that aid decision-making.

## Adopt Multilateral Market Models to Expand Electricity Trade

### Key Actions

- + Obtain political agreement, select a market model, and establish common working languages
- + Define technical standards.
- + Define institutional arrangements including settlement and payment mechanism and dispute resolution.
- + Provide enabling environments to increase trade frequency and integration by establishing regional co-operation among national regulatory authorities

### Minimum Requirements for Establishing Multilateral Power Trade

Political	Technical	Institutional
Political will	Harmonised technical standards (grid codes)	Institutional arrangements
Intergovernmental agreement(s)	Harmonised wheeling charge methodology	Settlement + payment mechanism
Common working language	Interconnector capacity calculation	Dispute resolution mechanisms
	Third party access	
	Data + information sharing mechanisms	

Source: IEA (2019a), Establishing Multilateral Power Trade in ASEAN.

### Strengthening Tajikistan's Role as a Flexibility Provider for the Region

#### Key Actions

- + Enhance capacity to optimise hydro operation in various markets.
- + Undertake refurbishments to adapt for increasing flexibility.
- + Initiate dialogue on additional transmission lines and upgrade existing lines where needed.