

Basic Characteristics of Tajikistan s Energy Internet



Overview

Inside Tajikistan's Internet: Connectivity Challenges, Costs, and the. In short, Tajikistan's connection to the global internet is bottlenecked and fragi.

Key Takeaways

Tajikistan's energy internet is predominantly hydropower-based, highly centralized, and increasingly integrated with regional electricity networks to enhance reliability and export capacity. Energy Generation and Mix

Tajikistan's electricity system is overwhelmingly dependent on hydropower, which accounts for approximately 90–98% of total electricity generation . The country has a theoretical hydropower potential exceeding 527 billion kWh annually, sufficient to meet Central Asia's energy needs multiple times over . Coal and hydrocarbons contribute only a minor share, while solar and wind energy remain largely untapped due to limited investment and infrastructure . The Roghun Hydropower Project, with a planned capacity of 3,600–3,780 MW, is central to expanding generation and enabling annual exports of up to 10 TWh by 2030 .

Transmission and Distribution



Tajikistan is upgrading its transmission infrastructure to support both domestic consumption and regional exports. Key projects include the 500 kV Datka-Sughd transmission line under the CASA-1000 initiative, which facilitates electricity exports to Pakistan and Afghanistan . Additional small- and medium-scale hydro and solar plants, along with new substations and transmission lines, are being commissioned to improve grid reliability and coverage . Despite near-universal electrification, rural and mountainous areas still experience seasonal outages due to hydropower variability in winter .

Energy Efficiency and Challenges

The country faces high energy intensity due to aging heating systems, poorly insulated buildings, and inefficient industrial and agricultural technologies . Subsidized energy tariffs limit investment in energy efficiency and renewable energy deployment . Seasonal hydropower fluctuations, climate change, and glacial retreat pose structural vulnerabilities to the energy system . Efforts to enhance energy security include reconnecting to the United Energy System of Central Asia, which allows multilateral energy trade and better integration of variable renewable energy .

Renewable Energy Potential

While hydropower dominates, Tajikistan has significant solar and wind potential. The government aims for non-hydropower renewables to provide 10% of generating capacity by 2030 . Complementary measures, such as energy efficiency improvements and the use of imported natural gas for transitional purposes, are being implemented to reduce emissions and enhance system resilience .

Summary

Tajikistan's energy internet is characterized by hydropower dominance, centralized generation, ongoing infrastructure modernization, and regional integration efforts. Key projects like Roghun HPP and CASA-1000, combined with renewable energy targets and efficiency measures, aim to improve reliability, expand export capacity, and reduce environmental impact while addressing seasonal and structural vulnerabilities .

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BACKGROUND To sustain long-term economic growth and development, Tajikistan needs an adequate and reliable electricity

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Population Sustainable Energy Statistics Trade Transport Urban Development, Housing & Land Cross Cutting Areas

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In Tajikistan's neighbouring countries, the various national ministries for energy, economy and trade as well as the

Tajikistan Energy Situation

Tajikistan is the poorest country in Central Asia and its economy remains fragile due to corruption, weak governance, unemployment,

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Secondly, to serve as a catalyst for the development of renewable energy sources in the region, it is crucial to consider regulating

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