



**CASA** → **1000**



Students in Tajikistan.  
World Bank Photo

## Electricity. It's essential for modern life. Without it, development is delayed and poverty endures.

One of the most complicated challenges in the world is to deliver electricity to the millions of people living without it—while also conserving precious natural resources. Even after more than a century of electric power supply, one simple fact remains: significant amounts of electricity cannot be stored and must be generated on-demand. Generate too much, it's wasted. Don't generate enough, electricity is cut off. This is why well-managed electricity systems are so critical.

In Central Asia, there are two countries that have a surplus of electricity during the summer. The Kyrgyz Republic and Tajikistan have some of the world's most abundant clean hydropower resources with water cascading from the mountain ranges and filling the rivers every summer. Nearby in South Asia, there are two countries that suffer from too little

electricity and fast-growing demand for it. Afghanistan and Pakistan cannot meet their citizens' electricity needs, especially during the sweltering summer, so there are frequent power cuts and millions of people living without electricity.

A new electricity transmission system, called CASA-1000, between all four countries would help make the most efficient use of clean hydropower in the northern countries by enabling them to transfer and sell their electricity surplus in the summer to the deficient countries in South Asia. The CASA-1000 project would also complement the countries' efforts to improve electricity access, integrate and expand markets to increase trade, and find sustainable solutions to water resources management.



Reservoir in the Kyrgyz Republic.  
Photo by Andrei Shevelov

## The smart use of mother nature is the objective of the CASA-1000 Project.

All of the necessary power generation infrastructure needed for CASA-1000 is already in place. When complete, the full CASA-1000 transmission lines will move electricity at high voltages between the Kyrgyz Republic and Tajikistan (the first 477 kilometers) and from Tajikistan to Afghanistan and Pakistan (the next 750 kilometers). Even without adding any new power generation to the system, sufficient quantities of surplus electricity are available in the Central Asian countries to supply these transmission lines.

This project demonstrates landmark cooperation between the Kyrgyz Republic, Tajikistan, Pakistan, and Afghanistan. The modern and efficient CASA-1000 electricity transmission system will help transform the region and signify an important step toward realizing the planned Central Asia-South Asia Regional Electricity Market (CASAREM). The CASAREM initiative will help not only these four countries, but also improve the electricity systems

and develop inter-regional cooperation between Central Asia and South Asia.

The CASA-1000 Project is ambitious but achievable. When compared with the 340,000-kilometer North American grid or the 230,000-kilometer European power system, the 1,222-kilometer CASA-1000 transmission project seems quite achievable but it will take time, long-term planning, and cooperation.

A high level Inter-Governmental Council has been established to help make CASA-1000 happen and regional cooperation in the first phases of the project has been excellent. Through the Inter-Governmental Council, the countries are working together to make decisions about project implementation and operation, common policies and rules, and use consistent technical, safety, and environmental standards. They are also planning consultations with the public and a wide-ranging community benefit-sharing plan.



Kyrgyz Republic



Tajikistan



Afghanistan



Pakistan



**Realizing the CASA-1000 vision will require:**

- 500 kV line from Datka to Khudjand (477 kilometers)
- 1300 megawatt AC-DC Converter Station at Sangtuda
- 750 kilometer High Voltage DC line from Sangtuda to Kabul to Peshawar
- 300 megawatt Converter Station at Kabul (with import and export capability)
- 1300 megawatt DC-AC Converter Station at Peshawar



Mountains in Tajikistan.  
World Bank Photo

## Exporting Countries: Central Asia

**With mountainous terrain and plentiful rivers, the Kyrgyz Republic and Tajikistan have great hydropower potential.**

Although the Kyrgyz Republic and Tajikistan both generate a surplus of electricity from hydropower during the summer, these countries suffer from electricity shortages during their cold winters. Because part of the summer electricity cannot be stored, this surplus cannot be used during their cold winters and the toll on their citizens is enormous.

The export of electricity into the CASA-1000 transmission system from existing Kyrgyz and Tajik hydropower plants would create significant revenues for both countries. The sale of electricity would only be from surplus summer generation, which is otherwise wasted, and would not impact winter generation or make shortages worse. In fact, the revenues from these exports could be invested to prevent winter electricity shortages.



Islamabad streets at night.

## Importing Countries: South Asia

**The lack of an adequate supply of electricity is a huge detriment to the economic development and security of Pakistan and Afghanistan.**

With growing populations and developing economies, both Pakistan and Afghanistan have fast-growing demand for electricity. At the moment, these countries' potential for growth is hindered by their electricity scarcity. Without power, businesses cannot invest or create jobs, hospitals and schools operate on expensive and polluting generators, citizens suffer from indoor air pollution caused by burning wood for heating and cooking, and people endure scorching summers without fans or air conditioning. Basic services that people in developed countries take for granted cannot be offered.

By building new transmission facilities, the CASA-1000 Project would give a much-needed boost to Pakistan's electricity situation. Given the sweltering heat in Pakistan, its peak demand for electricity occurs in the summer when its neighbors to the north have more

than enough electricity to share in the system. The imported energy would increase supply when it is needed most.

A functioning, affordable electricity system is critical to Afghanistan's stability. Transformative projects like CASA-1000 can enable improved transportation, telecommunications, industry, and social services—all aspects of a functioning economy that depend on electricity. The reliable supply of imported energy from the CASA-1000 transmission lines will allow for continued economic development based on existing, clean hydropower resources. Given its location in the transmission system, imported electricity that is not used in Afghanistan could be re-exported to Pakistan. This would generate valuable revenue for Afghanistan that could be re-invested into the country's continued development.



Faizabad, Afghanistan

Thomas J. Abercrombie/National Geographic Stock

## The long-term plan is about sustainable development, growth, and shared benefits.

Developing a strong economy with good jobs, modern infrastructure, proper social services, and inclusive growth requires a functioning electricity system. The CASA-1000 Project is an important step in building a functioning, efficient electricity system across Central Asia and South Asia. By facilitating clean power export revenues for the Central Asian countries and by alleviating electricity shortages in the South Asian countries, this project will enhance growth prospects across both regions.

Realizing CASA-1000 will require strategic actions and a long-term vision, private sector and government participation, and the support of many partners. Ultimately, the realization of this ambitious project will deliver reliable, affordable electricity to parts of the world that desperately need it—in summer and winter. It will prompt inter-regional cooperation, investments in social services, and encourage community benefit-sharing. Most importantly, it will strengthen the economic and political development of the region.

The Kyrgyz Republic, Tajikistan, Pakistan, and Afghanistan have put an important framework in place for making CASA-1000 a reality—the Inter-Governmental Council. In addition to the commitment of these four countries, CASA-1000 has the support of the World Bank Group, Islamic Development Bank, United States Agency for International Development (USAID), US State Department, United Kingdom Department for International Development (DFID), Australian Agency for International Development (AusAID), and other donor communities.