



**CASA** → **1000**



*Pakistani children studying at home*

## **CASA-1000 will enable seasonal hydropower surplus from Central Asia to serve the growing demand in Afghanistan and Pakistan**

Some countries in Central Asia enjoy a surplus of electricity during the summer season. The Kyrgyz Republic and Tajikistan have some of the world's most abundant clean hydropower resources. By contrast, in nearby South Asia, Afghanistan and Pakistan struggle to meet their citizens' electricity needs during the same period. As a result, millions of people must deal with frequent power outages while others live without electricity altogether.

**CASA-1000**, a new high-voltage electricity transmission system connecting the four countries in Central and South Asia, will help alleviate chronic energy shortages by facilitating trade of electricity from the energy-abundant north to the energy-deficient south. **CASA-1000** highlights the concerted efforts to improve regional access to electricity, integrate and expand markets to increase cross-border trade, and improve sustainable management of water resources.



*Transmission line support tower*

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## CASA-1000 is a model for regional economic cooperation

The necessary power generation infrastructure that supports the CASA-1000 transmission architecture is already in place. When complete, CASA-1000 transmission lines will move electricity at high voltage between the Kyrgyz Republic and Tajikistan (the first 470 km) and then over the DC line from Tajikistan to Pakistan (the next 777 km). Additional opportunities exist to power Afghanistan through the existing 220 kV AC line that will interconnect to the yet-to-be-constructed back-to-back AC-DC substation. Even without adding any new power generation assets to the system, sufficient quantities of surplus electricity are available in the Central Asian countries to be transferred over these transmission lines.

CASA-1000 exemplifies high-level political and economic cooperation among the four governments – Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan. When completed, the project will fundamentally transform the regional energy trade landscape, and serve as an important step toward improving the economic ties between Central and South Asia while boosting inter-regional cooperation and stability.

CASA-1000 is an ambitious regional project that requires extensive long-term planning and inter-governmental cooperation. To this end, a high-level Inter-Governmental Council (IGC) has been established, comprising Ministers from the four participating countries. The IGC oversees the design, preparation, negotiation, and implementation of the project. On its behalf, an IGC Secretariat manages the day-to-day coordination of project activities and facilitates the resolution of outstanding issues. A dedicated Joint Working Group (JWG), consisting of a high-level government representative from each project country (typically a Deputy Minister), considers further technical and procedural actions to address project constraints. The JWG conducts regular business meetings and is complemented by international and local advisors retained by each country, as needed.



*IGC members at the opening ceremony of the CASA-1000 Project Implementation Phase*

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## CASA-1000 Power Transmission Power requires

- 470 km 500 kV AC line from the Datka substation in the Kyrgyz Republic to the Khodzhent substation in Tajikistan;
- 115 km 500 kV AC line in Tajikistan between the Regar and Sangtuda substations;
- 1300 MW AC-DC convertor station at Sangtuda in Tajikistan;
- 777 km HVDC line from Sangtuda, Tajikistan to Nowshera, Pakistan;
- 1300 MW DC-AC converter station at Nowshera;
- Back-to-Back (B2B) HVDC substation in Afghanistan.



Updated by Energy Links, 2018

CASA-1000 transmission system infrastructure, for illustrative purposes

## Exporting Countries: Central Asia

### **CASA-1000 will provide reliable income from the electricity export revenues to the Kyrgyz Republic and Tajikistan**

Although the Kyrgyz Republic and Tajikistan both generate a surplus of electricity from hydrological resources during the summer season, the two countries suffer from intermittent electricity shortages during the winter months.

Export of electricity over the CASA-1000 transmission system architecture from the existing hydropower plants will create significant revenues for both countries, allowing for further investments to prevent winter electricity shortages.

### **What are the Objectives and Benefits of the Project?**

- Serve as a critical first step toward deepening the regional energy cooperation and establishing stronger prospects for cross-border electricity trade.
- Help recognize Afghanistan as a viable transit country while improving its economic growth opportunities and stability prospects.
- Ensure a steady source of revenues for Tajikistan and the Kyrgyz Republic that can be used to alleviate acute winter energy shortages.
- Alleviate electricity deficit in Pakistan and Afghanistan during the peak summer season and reduce their dependency on costly, polluting oil-based power generation.
- Facilitate power supply opportunities for other countries in the region, thus expanding the framework for expanded trade arrangements beyond the original summer period, allowing CASA-1000 to run effectively year-round.



*Nurek hydro power plant in Tajikistan*

## Importing Countries: South Asia

### **CASA-1000 will establish significant sources of electricity to support growing demand in Pakistan and Afghanistan**

With the growing populations and developing economies, both Pakistan and Afghanistan have fast-growing demand for electricity that outpaces available supply. More robust economic growth is further hindered by scarce electricity. Without power, domestic businesses cannot invest or create jobs, hospitals and schools operate on expensive and polluting generators and at reduced capacity, 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, CASA-1000 will give a much-needed boost to Pakistan's electricity grid. Given the sweltering heat in Pakistan, its peak demand for electricity occurs in the summer when its neighbors to the north

have more electricity to share. The imported electricity will increase supply when it is needed most.

A functioning and affordable electricity system is critical to Afghanistan's economic stability. By providing an increased and more reliable power supply to Afghanistan, CASA-1000 recognizes that Afghanistan is a viable transit country between Central and South Asia, and enhances its prospects for further development of the national power system infrastructure. Increased electricity supply via imports on existing AC lines from Tajikistan will allow for continued economic development based on clean and environmentally sustainable hydropower resources. Transit of electricity through its territory would generate valuable revenue for Afghanistan that can be reinvested into the country's continued electrical grid and economic development.



*Karachi at night*  
Photo credit by: [Wikimedia Commons](#)



Faizabad, Afghanistan  
Photo credit by: Thomas J. Abercrombie/National Geographic Stock

## **CASA-1000's vision focuses on long-term sustainable development, economic growth, and shared benefits**

Developing strong national economies with good jobs, modern infrastructure, adequate social services, and inclusive growth requires a functioning electrical system. The CASA-1000 Electricity Transmission and Trade Project is an important step in building a well-functioning and integrated electricity system across Central and South Asia. By facilitating revenues from clean power exports for the Central Asian countries and alleviating electricity shortages in the South Asian countries, this collaborative enterprise will enhance growth prospects in both regions.

Realizing CASA-1000 will require strategic actions and a long-term vision, private sector engagement and continued political support. Ultimately, the realization of this ambitious project will deliver reliable and affordable electricity to parts of the world that desperately need it. It will rely on inter-regional cooperation, spur investment in social services, and encourage community benefit-sharing. Most importantly, it will bridge the two regions by strengthening the economic and political ties across Central and South Asia.

*In addition to the commitment of the four participating countries, CASA-1000 is supported by a number of multilateral and bilateral international lending institutions, including the World Bank Group (WBG), Islamic Development Bank (IsDB), United States Agency for International Development (USAID), U.S. State Department, United Kingdom Department for International Development (DFID), and other financial institutions.*