



India: Hydro Power in the Himalayas



Harnessing the power of the river to generate electricity



Supplying clean electricity to millions of people

KEY FACTS

India's environmental challenges are multiplying at an alarming rate. The combination of a fast pace of development and a rapidly growing population is putting tremendous strain on the environment, infrastructure, and the country's natural resources. The vast majority of the country's energy needs are met by carbon-intensive fossil fuels, including coal and oil. Unfortunately, India's use of fossil fuels has come at the cost of increased risk to public health and environmental degradation. India's reliance on coal and oil has led to a nine-fold jump in carbon emissions over the past forty years. With energy demand expected to double by 2025, India is facing a complex political, economic and environmental dilemma.

Located along the southern edge of the Himalayas, the state of Sikkim enjoys an abundant flow of fresh water. Thanks to glaciers in the mountains and a strong rain season, Sikkim is host to a consistent flow of water which provides optimal conditions for the production of hydropower. This project is a run of river hydro power plant with an aggregated installed capacity of more than 510 MW. Assuming energy generation at 90% and reliability of 95%, annual energy production amounts to 2600 GWh.

The project contributes to clean and sustainable energy supply in the region, which is still largely dominated by coal-fired plants with high emissions.

Sustainability Benefits

The project activity brings significant investment in this remote region, which lacks in the basic infrastructure. The economy is based primarily on agriculture, with very little heavy industry. Yet energy demand has still been shown to be substantial, and the regional grid is normally reliant on fossil-fuel based facilities.

By utilizing the flow of the river, the project will help reduce demand for fossil fuels, protect the environment from deforestation, reduce GHG emissions and contribute to the economic growth of the state.

Since the project displaces energy generated by coal-fired power plants, it also reduces concentrations of other air pollutants such as soot, sulphur dioxide, nitrogen oxides and other particles.

Location:

Singtam, East Sikkim District

Project type:

Renewable energy, Hydropower

Project standard:

VCS

Total emission reductions:

»» 2 Million t CO₂ e p.a. ««

Project start date:

March 2008

Project partner:

NHPC Limited (National Hydroelectric Power Corporation)

Validator:

TÜV Nord

Verifier:

TÜV Nord





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Die Technik: Wasserkraftnutzung

Hydro power is one of the oldest means of using energy. The principle is simple: All it needs is water and a difference in vertical height. The kinetic energy of the water flow drives a turbine coupled to a generator and thus is transformed into electricity.

This project is of the run-of-river type. The plant uses the natural flow of the river and diverts only part of the stream to drive the turbines. Since it does not utilize a large reservoir impounded by a dam to artificially create a vertical height difference, the effects on the river discharge and the river banks are minimal. The project does not lead to flooding or the resettlement of people. Run-of-river hydro power plants illustrate a great balance between utilizing a natural potential and low environmental and social impact.



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