

SOLAR PANELS INSTALLED OVER IRRIGATION CANALS TO REDUCE LAND USE AND WATER LOSS IN INDIA

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In 2025, India advanced its national initiative to install solar panels over irrigation canals, a sustainable solution to simultaneously generate renewable energy while helping conserve land and reduce water evaporation.

This innovative solution was designed by Indian engineers and the first 750m pilot solar canal stretch (1 MW) was built in the Gujarat State in 2014 by the Gujarat State Electricity Corporation (GSECL) with support from *Sardar Sarovar Narmada Nigam Ltd* (SSNNL), which owns and maintains the canal network. When placed over a canal, solar arrays do more than produce electricity in land-constrained areas. They also keep cool, and thus operate more efficiently, thanks to the water below. Shade from the panels, meanwhile, can reduce evaporation and limit harmful algae growth in the waterway. With these basic characteristics, the solar canals currently designed in India and in other countries adapt the technology to specific contexts by improving the efficiency of the plants.

In 2015 this Canal Top Solar Power Plant built in Vadodara was inaugurated by at the time UN Secretary-General Ban Ki-moon and the Prime Minister of India. The UN Secretary-General recognized India's bright creativity, ingenuity and cutting-edge technology and declared this innovative solution useful for the world. Since then, a number of other projects have been designed and built in the State of Gujarat working in partnership with different private investors, and the government has planned to cover more than 19,000 kilometers of canals with solar panels. More initiatives will be planned in a territory which has over 458 kilometers of main canals and thousands more in smaller branches.

After the success of the canal-top solar plants in Gujarat, new solar canals have also been implemented in eight Indian states, designed taking into account the specific characteristics of the territories. All these projects are part of the Ministry of New and Renewable Energy of the Government of India (MINRE) plans and the Indian Government's policy of intensifying the production of renewable energy to meet the needs of the country. The funds are provided both by the National Government and the involved states to carry out the works and ensure their maintenance. The local governments are also developing campaigns to involve private companies in this innovative way of producing renewable energy.

In 2025, in this framework, the Delhi Government decided to explore a plan to install solar panels over the Munak Canal, a critical source of raw water supply for the city. Delhi is planning to cover the 17 km Munak Canal to curb water loss and enhance energy production. The Munak Canal system stretches over 102 km, of which 17 km passes through Delhi and reports indicate that the Canal loses up to 35% of its water due to inefficiencies, evaporation and seepage. Covering the canal with solar



panels could significantly reduce these losses and improve water efficiency. In addition to conserving water, the solar panels will generate renewable electricity for Delhi's power grid. This approach utilizes unused canal airspace, thus saving valuable urban land and supporting the city's transition to cleaner energy sources. It also offers a potential boost in solar panel efficiency due to the cooling effect of the flowing water below. The project is still in the feasibility stage, with agencies like the Delhi Jal Board currently preparing a detailed project report and technical design. These studies will assess cost-effectiveness, engineering requirements, and environmental impacts before implementation begins. Once finalized, the Munak Canal solar project could become a model for sustainable infrastructure in urban India. If successful, the concept may be replicated across other water bodies in Delhi, offering a blueprint for integrating renewable energy with smart water management.

Combining Renewable Energy and Water Conservation, the Government of Punjab also began planning in 2025 [the launch of a 40 MW canal-top solar project to enhance clean energy production and optimize land use](#). Solar panels will be installed above irrigation canals, reducing water evaporation and maximizing renewable energy output. The initiative supports the state's sustainability goals, promotes efficient land utilization, and contributes to India's broader clean energy expansion and climate action efforts.

[India has launched the ambitious project to cover irrigation canals with solar panels, solving two problems at once, power generation and water conservation](#). With its hot climate, India loses enormous amounts of water every year through evaporation in open canals. By installing solar canopies, the country reduces this water loss while simultaneously producing clean electricity. Pilot projects in Gujarat have already shown remarkable results. The panels not only save thousands of liters of water but also generate enough electricity to power villages and nearby farms. Unlike traditional solar farms that require large areas of land, these projects use space that already exists, ensuring that no agricultural land is displaced. Farmers benefit from reliable irrigation and energy, making it a powerful tool for rural development. If scaled nationally, solar canal projects could provide energy for millions while safeguarding water, one of India's most precious resources. This creative combination of clean energy and water security demonstrates how integrated infrastructure can help nations tackle climate change while supporting food security.

In particular, the solution of the solar panels installed on the irrigation canals has shown that it can bring multiple benefits, documented in the projects already carried out in the country:

- The first advantage is that it allows the reduction of the growing use of land to install on-ground solar panels. In all countries the current solar parks bring important benefits in terms of renewable energy production while generating problems for agriculture, forests, landscapes and local communities' activities.
- Thanks to the reduction of the water temperature, the panels installed above the channels are more efficient than those installed on the ground. The energy generated from the solar canal can provide electricity for farmers during the energy-intensive irrigation season, and outside the season the electricity can be fed into the state grid, sold to distribution companies or used by the canal authority.
- The solar panels provide shade for the water flowing through irrigation canals. They prevent evaporation from the canals which are passing through dry and sun-baked regions. Covering the canal saves water, creating a more efficient irrigation system and improving water security for farming communities that rely on the canal.



- Another advantage of the panels' shade is curbing algal blooms in the canals. Algae growth can clog water pumps and cause toxicity, and with the installation of the solar panels and the absence of direct sunlight, algae growth is drastically minimized.
- The cost of solar power is much less than that of regular solar power plants because the panels cover the canal with a single installation. The governments do not have to spend much money creating basic infrastructure, such as acquiring land.

In a global context that makes the transition to renewable energy increasingly urgent to reduce the disastrous effects of climate change, many countries have been inspired by the innovative solution implemented in India and are carrying out specific studies to adopt it.

The first project inspired by India's experience was implemented in California's Central Valley Irrigation District, involving key stakeholders and generating interest in replicating it elsewhere in the United States. Another project for the construction of solar panels above irrigation canals is underway in Nepal's Banke District, where solar panels will be installed along a stretch of the 15-kilometer main canal, utilizing existing cross-drainage structures for mounting. The goal for the initial phase is to generate 1 MW of clean energy and the pilot project will receive financial and technical support from the Asian Development Bank (ADB).

To know more

[Canal Solar Power Project in Wikipedia.org](#)

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[Delhi's Canal-Top Solar Plan in eqmagpro.com](#)

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