



PUBLIC
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A Solar Energy Initiative to Reduce Cost and Carbon Footprint *HBT Medical College and Dr RN Cooper Municipal General Hospital*

GGHH Agenda Goals

- Energy

Hospital Goal

- Reduce energy costs
- Reduce carbon dioxide emissions
- Promote clean energy

Progress Achieved

- Energy savings: Capacity of solar water heating system installed at the 6 buildings of the hospital is 18,000 litres (L) per day which saves Rs 2,70,0000 (\$37,500) per year
- Environmental benefit: Solar water heating system installed at the hospital saves around 270 tonnes of CO₂ emission per year

The Issue

With the growing determination to become world's greatest solar energy success story, the Indian Government is adopting and launching different solar energy applications through several schemes at both State and Central level. The country aims to have a solar capacity of 100 GW by 2022 which will account for three fourths of the planned renewable energy capacity of 175 GW. Benefits of adopting solar energy are not just limited to the reduction of carbon dioxide emissions but also the decrease in power costs since it requires one time investment during the installation phase with minimum maintenance cost.

The amount spent during the installation stage usually gets recovered over a specified period of time. One of the most popularly adopted solar applications is solar water heating system, installation of which has gained momentum across both institutional and individual level. The most common examples of institutions that have adopted these include government universities, hospitals, residential complexes etc.

HBT Medical College and Dr. RN Cooper Municipal General Hospital is one such public hospital in Mumbai that has taken up the initiative to install solar water heating system to reduce carbon dioxide emissions and their power costs.

Sustainability Strategy Implemented

With a clear vision of reducing the energy costs and carbon footprint of the hospital, the management team at the municipal general hospital installed solar water heating system with a

capacity of 3000 L per day (each) on 6 buildings within the hospital campus (include staff quarters, girls hostel, boys hostel, officer's quarters, nurses school and training centre). A local solar energy installation company, Genex Renewable Energy Mission, assisted with the set up of the new system.

- The technical staff of Brihanmumbai Municipal Corporation (BMC), a local municipal body in Mumbai, and technical staff at the hospital carried out a detailed cost benefit analysis with respect to the cost of installation, projected savings and estimated maintenance expenditure.
- The analysis team submitted their findings and suggestions to the hospital administration and governing body for required funds and resources.
- The hospital contracted the Genex Renewable team to install the solar water heating system and its rooftop panels.
 - The company is responsible for maintaining the solar panels and the entire heating system at the hospital on contractual basis.
- Genex Renewable team provided trainings to the technical staff at the hospital and BMC staff appointed within the hospital for coordination and technical assistance.

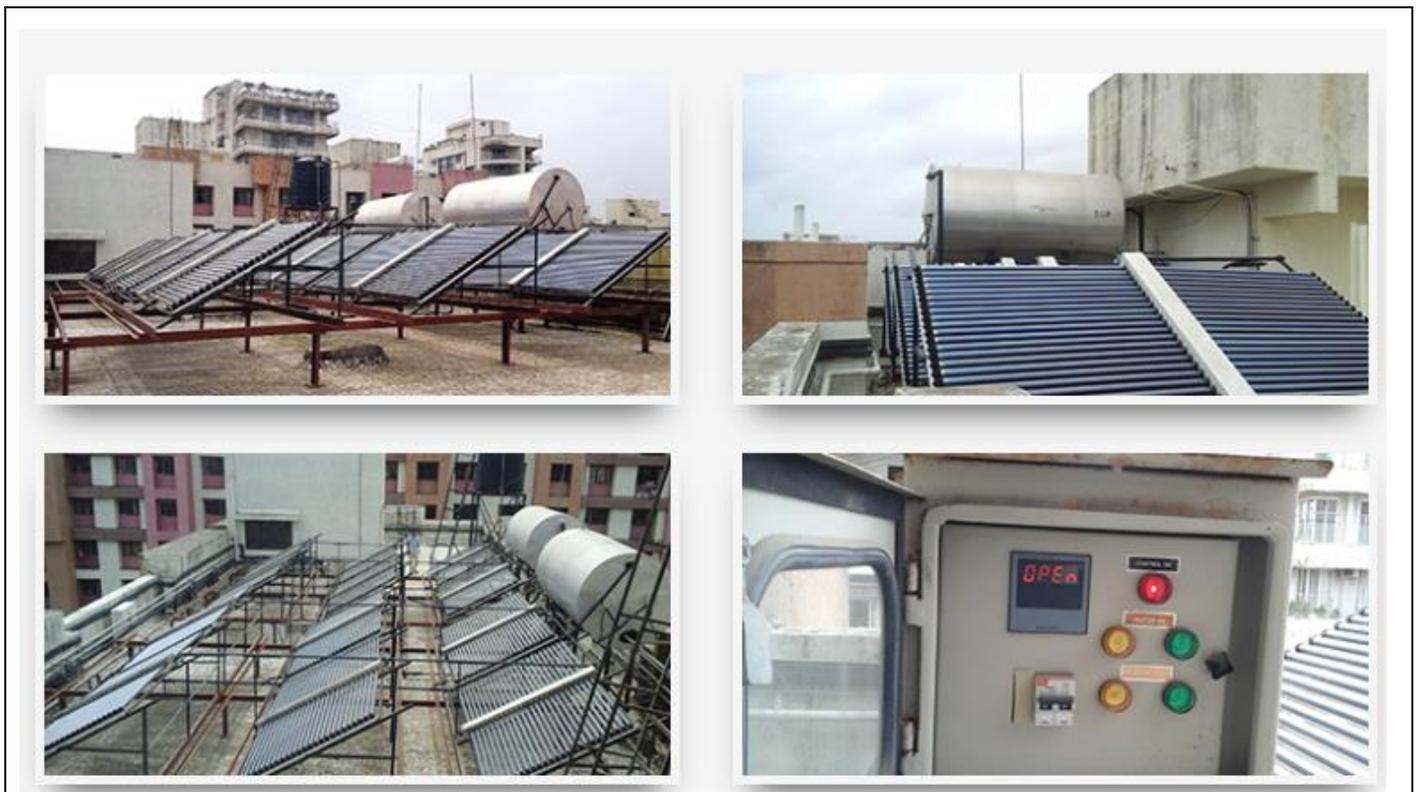


Fig 1: Solar Water Heater System installed at HBT Medical College and Dr RN Cooper Hospital

- After the successful completion of training, the hospital assigned dedicated internal staff members to regularly clean the solar panel for maximum capacity and report for any inefficiency or performance issues.
- The hospital deployed one senior electrical engineer along with assistants to assist and coordinate for the efficient functioning of the solar water heating system.

Implementation process

The initiative begun as a cost cutting measure as well as an opportunity to reduce the carbon footprint generated by the municipal general hospital. A solar water heating system produces a total of 18,000 litres of warm water for patients and other healthcare deliveries on a daily basis. The hospital electric department and the dean of the hospital are monitoring and evaluating this initiative. The staff members are involved in cleaning and managing the solar panels whereas the external vendor is responsible for installation and maintenance of the solar panels.

Tracking Progress

The capacity of solar water heating system on each of the 6 buildings of the campus is 3000 litres (L) per day, which is equal to 18,000 L as total capacity of 6 buildings. On an average day a 100 L of water per day, heated from the system, saves up to 1500 electricity units per year as per the efficiency capacity installed. So, an 18000 L per day system saves 27,0000 electricity units per year. Cost of one unit of electricity is 10 INR, given the savings, it will result to 2,700,000 INR (\$37,500) per year. The total cost in installing this system is 4,230,000 (\$58,570). The hospital will see a full return on investment of this system in 19 months. As per market research, the average life expectancy of certified solar water heating systems is 20 years, much longer than standard gas or electric storage water heaters.

Electricity unites saved: $180 \times 1500 = 27,0000$ units of electricity per year

Total financial savings per year: $27000 \text{ units} \times 10 \text{ INR} = 2,700,000 \text{ INR}$

Total installation cost of 18000 Solar water heating system:

$18000 \times 235 \text{ INR per litre} = 4,230,000$

Also, to generate 1500 units of electricity per year from a coal based power plant, 1.5 tonne of CO₂ is released in the atmosphere. Considering an 18000 L per day system saves 27,000 electricity units per year, this in turn reduces 270 tonnes of CO₂ emission into the atmosphere.

Challenges and lessons learned

- The panels need to be cleaned regularly, as the panels accumulate lot of dust due to proximity to main road.
- Winter months are subjected to loss of productivity due to smog and cloud cover.

Next Steps

The management will be taking further steps towards achieving higher efficiency in the current system in order to continue to reduce emissions and energy consumption.

Demographic information

HBT Medical College and Dr RN Cooper hospital is a major municipal general hospital located in the western suburbs of Mumbai. The hospital was established in 1969 and upgraded into Medical college in August 2015. It is a 636 bedded secondary care hospital with all general specialties.

Links

To learn more about Health and Environment Leadership Platform's and its members:

<https://www.ceh.org.in/activities/help/about/>

To gain access to HELP's Information, Education and Communication materials and other case studies:

<https://www.ceh.org.in/activities/help/resources/>

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