

Solar water heating system and jnnsnm in india



**ASSIGN
BUSTER**

Solar energy, being abundant and widespread in its availability, makes it one of the most attractive sources of energies. Tapping this energy will not only help in bridging the gap between demand and supply of electricity but also save money in the long run. A 100-litre capacity Solar Water Heating System (SWHS) can replace an electric geyser for residential use and may save approximately 1500 units of electricity, annually, under Indian conditions.

It has also been estimated that a 100 litre per day (lpd) system (2 m² of collector area) installed in an industry cans save close to 140 litres of diesel in a year. Based on the above equivalence (100 lpd system saves 1500 units of electricity), it is estimated that in generating the same amount of electricity from a coal based power plant, 1. 5 tonnes of CO₂ is released into atmosphere annually. One million SWHS installed in homes will, therefore, result in reduction of 1. 5 million tonnes of CO₂ emission into the atmosphere.

About JNNSM

The Jawaharlal Nehru National Solar Mission (JNNSM) is a major initiative of the Government of India and State Governments to promote ecologically sustainable growth while addressing India's energy security challenge. It will also constitute a major contribution by India to the global effort to meet the challenges of climate change.

The immediate aim of the Mission is to focus on setting up an enabling environment for solar technology penetration in the country both at a centralized and decentralized level. The first phase (up to 2013) will focus on capturing of the low hanging options in solar thermal; on promoting off-grid

systems to serve populations without access to commercial energy and modest capacity addition in grid-based systems. In the second phase, after taking into account the experience of the initial years, capacity will be aggressively ramped up to create conditions for up scaled and competitive solar energy penetration in the country. Some of the targets of the solar mission with regards to SWHS are :

- To create favourable conditions for solar manufacturing capability, particularly solar thermal for indigenous production and market leadership.
- To promote programmes for off grid applications, reaching 1000 MW by 2017 and 2000 MW by 2022.

The Mission in its first two phases will promote solar heating systems, which are already using proven technology and are commercially viable. The Mission is setting an ambitious target for ensuring that applications, domestic and industrial, below 80 °C are solarised. The key strategy of the Mission will be to make necessary policy changes to meet this objective:

- Firstly, make solar heaters mandatory, through building byelaws and incorporation in the National Building Code,
- Secondly, ensure the introduction of effective mechanisms for certification and rating of manufacturers of solar thermal applications,
- Thirdly, facilitate measurement and promotion of these individual devices through local agencies and power utilities, and
- Fourthly, support the upgrading of technologies and manufacturing capacities through soft loans, to achieve higher efficiencies and further cost reduction.

The Bangalore Mahanagara Palike vide Bye-law No. 29 has issued order for making the usage of solar water heaters mandatory for the buildings having

200 Sq. Mtrs. of floor area or 400 Sq. mtrs. of site area and 500 LPD for Apartments having 5 units. To encourage the use of solar water heaters, which helps in reduction of peak loads, all Electricity Supply Companies in Karnataka are providing the rebate of 50 ps per unit with a maximum limit of Rs. 50 per installation. So far, around 5 Lakh Collectors have been installed in the State of Karnataka. In some state governments, rebates up to Rs. 100 in monthly electricity bill for a 100 litre LPD is being provided.

Recent policy of Indian govt. regarding SWHS

MNRE has approved the financing of Flat Plat and Evacuated Tube Collector based solar water heating systems manufactured / installed by the BIS approved manufacturers of the system by the banks, with capital subsidy and refinance support from NABARD.

The quantum of capital subsidy and refinance would be made available as per the specifications of MNRE/ IREDA from time to time. For Evacuated Tube Collectors (ETCs) based solar water heating systems, capital subsidy will be limited to Rs. 3000 per square metre of collector area while for Flat Plate Collectors (FPCs) with liquid as the working fluid, the subsidy will be limited to Rs. 3300 per square metre. For flat Plate Collectors with air as the working fluid, the capital subsidy is limited to Rs. 2400 per square metre of collector area.

The eligible capital subsidy would be released upfront to the banks on receipt of the drawal application format after sanction of the loan by the bank. The capital subsidy component would, however, be released to the suppliers on behalf of the borrower by the financing Banks only after

<https://assignbuster.com/solar-water-heating-system-jnnsn-in-india/>

satisfactory installation and commissioning of the system. However, in order to enable the borrowers to access the benefit of the capital subsidy, the loan repayment period would have a minimum lock in period of 3 (three) years from the date of disbursement of the first instalment of the loan.

The borrowers are required to bring in 20% of the cost of the project as the margin money for accessing credit facilities from banks to acquire the assets. The loans to cover the balance after reducing the eligible capital subsidy, would be extended with a repayment period not exceeding 5 years and would carry an interest rate of 5% p. a. No interest will, however, be charged by the financing banks on the capital subsidy component.

The attractiveness of SWHS

It makes economic sense to think beyond the initial purchase price and consider lifetime energy costs. One would spend much more on electricity over an electric geyser's lifetime when compared to the initial price of Solar Water Heater Heating System and its maintenance over its expected lifetime of 15-20 years. Thus the overall cost of SWHS from cradle to grave would be a small fraction of that in case of electric geyser, not to mention the invaluable environmental benefits of SWHS.

However, immense care should be taken in choosing a solar water heater in the same way as one would in the purchase of any major appliance. A solar water heater is a long-term investment that will save money and energy for many years. Like other renewable energy systems, solar water heaters minimize the environmental effects of enjoying a comfortable, modern lifestyle. In addition, they provide

<https://assignbuster.com/solar-water-heating-system-jnnsnm-in-india/>

insurance against energy price increases, help reduce our dependence on foreign oil, and are investments in everyone's future.

The use of 1000 SWHSs of 100 litres capacity (2000 m² of collector area) each can contribute to a peak load shaving of 1 MW. Also, a SWHS of 100 litres capacity can prevent emission of 1.5 tonnes of carbon-dioxide per year.

The challenges and way forward

The main challenges to achieving a 15% CAGR in SWHS collector area from now up to the targeted values in 2022 are:

1. Market Barriers concerning high initial cost of the SWHSs and inefficient supply chain from manufacturing to installation at customer's premises which thwarts adoption of SWHSs even when the scheme is supported by soft loans, capital subsidy and electricity rebates.
2. Technological barriers concerning higher efficiency SWHSs in which the space constraints issues, maintenance & quality issue of components issues are overcome by enabling more energy conversion per unit area of solar collector.
3. Administrative barriers like lack of enforcement & monitoring of relevant building bye-laws wherever existing and lack of one-stop solutions for SWHSs which result in good intentioned policies remaining on paper or not producing the desired output.

4. Lack of enabling mechanism such as markets offering simple and customised solutions for mass dwelling/institutional/commercial units like multi storey apartments/BPOs/food courts etc. 5. Inadequate mass awareness programmes.

In economic parlance, solar energy and electricity and extending the relationship further, solar energy based products and electricity-based products should be perfect substitutes. When the price of electricity goes up, the demand for solar energy should go up. The price of grid connected and off grid electricity is going up but it is not translating into increased demand for SWHSs because of imperfections mentioned beforehand. Therefore, the policies should be geared towards removing the barriers and pushing SWHS in consideration set of energy consumers so that tangible and intangible benefits of SWHS accrue to the individual and the nation.