

Ministry of New and Renewable Energy
UNDP/GEF Global Solar Water Heating Project

Background Paper
on
Status of Solar Water Heating in India

The gross potential for solar water heating systems in India has been estimated at 140 million sq. m. of collector area. Of this, 40 million sq.m. has been estimated as the realizable techno-economic potential at this stage. A total of 2.6 million sq. m. of collector area has so far been installed in the country for solar water heating, of which about 1.55 million sq. m. has been installed since 2005-06. The achievement so far has been modest compared to the overall potential. However, a reasonable infrastructure has emerged and experience is available for manufacture and installation for solar water heating systems. A target of 5 million sq. m. has been set for the 11th Plan (2007-12) and a goal of 20 million sq. m for 2020.

MNRE Solar Water Heating Scheme

2. In order to accelerate development and deployment of solar water heating systems in the country, a modified programme of support was introduced by the Ministry in 2005. The main objective of the programme is to promote the widespread use of solar water heaters in the country through a combination of financial and promotional incentives, and other support measures so as to conserve electricity and other fossil fuels, apart from peak load shaving in cities and towns. Soft loans are provided to the users under the interest subsidy scheme through a network of financial institutions, public/private sector banks, scheduled co-operative banks, RBI approved non-banking financing companies, IREDA and its intermediaries. Interest subsidy is provided to enable loans to be extended at effective interest rates of 2% to domestic users, 3% to institutional users and 5% to industrial/commercial users. Interest free loans are available to domestic users in the North-Eastern States, Sikkim, Himachal Pradesh, Islands, J&K, Uttarakhand, Chattisgarh and Jharkhand. Overall fund management has been entrusted to IREDA.

3. The banks/FIs are required to provide loans at prescribed rates to beneficiaries and claim interest subsidy (difference between the lending rate of banks/FIs and MNRE prescribed interest rates) from IREDA. A uniform lending rate based on the RBI rate and existing rates of various banks/FIs is fixed and periodically reviewed. The interest subsidy, calculated on upfront basis for the entire loan period, and duly discounted is released by IREDA to the

banks/FIs on reimbursement basis after installation of the systems and submission of the necessary documents. Banks are to maintain a complete list of beneficiaries with relevant details of the installation, which is to be provided to IREDA. IREDA and public sector banks may also act as financial institutions for providing loans to its intermediaries (SNAs/ NBFCs/ approved manufacturers/suppliers etc.) who may further on-lend to the users at the rates prescribed by MNRE. Intermediaries are eligible to receive loans at 2% lower interest rate than the prescribed rates for various categories of users.

4. 31 banks and financial institutions are participating in the scheme through their branch network in different parts of the country. Frequent interaction meetings have been held with the banks and financial institutions towards easy availability of loans at effective interest rates and expansion of loan facilities from all branches across the country. IREDA and the banks/FIs are provided administrative costs for implementation of the interest subsidy scheme. An incentive is also available for motivators who bring customers to banks/FIs.

5. Capital subsidy equivalent to upfront interest subsidy is available to institutions and commercial establishments that do not avail soft loans. Profit-making commercial and industrial establishments are entitled to 80% accelerated depreciation. In addition, capital subsidy is available to builders & developers/ development authorities/ housing boards/ co-operatives/ Group Housing Societies for providing solar water heating systems in new buildings and housing/ commercial/institutional complexes. Systems installed in ESCO mode, where hot water is supplied as an energy service, are also eligible for capital subsidy.

Regulations & Promotional Measures in States

6. A model regulation / building bye-law for installation of solar assisted water heating systems in new buildings was circulated by the Ministry of Urban Development to all States and Union Territories with a request for onward circulation to all local bodies for incorporation in their building bye-laws. Necessary orders have been issued in 19 States. 41 Municipal Corporations/Municipalities have so far amended their building bye-laws, or issued necessary GOs, in six States. Municipal Corporations are being encouraged to provide rebate in property tax for those dwellings/buildings where solar water heating systems have been installed. Four Municipal Corporations i.e. Thane, Amravati, Nagpur and Durgapur have announced 6-10% rebate in the property tax for users of solar water heaters. State Electricity Regulatory Commissions (SERC) /utilities are being encouraged to provide rebates in electricity tariff to such users. The utilities in Rajasthan, West Bengal, Assam, Haryana, Uttarakhand and Karnataka are already providing such rebates up to Rs. 150 per month per

domestic system. Incentives are available for municipal corporations and utilities that promote solar water heating.

Standards & Codes

7. BIS standards have been established for flat plate solar collectors alongwith appropriate test facilities. ETC based systems are also being promoted, though the tubes used in them are being imported at present. Equal importance is being given to both types of systems, whether flat plate collector or evacuated tube collector based systems. Choice of selection of a specific type of system is left to the user depending on his location, requirement etc. Development of BIS performance standards for ETC collectors and for solar water heating systems based on both types of collectors is at an advanced stage.

8. Solar water heating systems have been incorporated in the new National Building Code. The Energy Conservation Act 2001 provides for suitable steps to be taken by the Bureau of Energy Efficiency (BEE) to prescribe guidelines for energy conservation buildings codes. Accordingly, BEE have developed the Energy Conservation Building Code (ECBC) which sets minimum energy efficiency standard for design and construction. Solar water heating systems are included among the building components covered under ECBC. Solar water heaters are required to meet at least 20% of the design capacity for water heating. ECBC is expected to impact and promote market development of various energy efficient products such as solar water heaters. An energy labeling scheme similar to the star rating scheme for air conditioners and refrigerators could also help in market promotion of efficient solar water heaters.

9. The Ministry has been promoting the design and construction of solar/ green/ energy efficient buildings based on solar passive techniques and active renewable energy systems. Building rating systems have been found to be quite effective in raising awareness and popularizing green building design. A National Rating System, GRIHA, has been developed indigenously keeping in view our climatic conditions and which is suitable for all types of buildings in different climatic zones of the country. It takes into account the provisions of the National Building Code 2005, the Energy Conservation Building Code 2007, and other IS codes and local by-laws. Through various qualitative and quantitative assessment criteria, GRIHA would be able to 'rate' a building on the degree of its 'greenness'. The rating would be applied to different types of new and existing buildings, whether commercial, institutional, or residential. The 100 point 34 criteria rating system includes a separate criterion which prescribes 70% or more of the annual energy required for heating water to be met through renewable energy based water heating systems, which are primarily expected to the solar hot

water systems. Financial incentives are available for adoption of the National Rating System with a view to promote large-scale design and construction of green buildings in the country. Energy-efficient solar buildings has been identified as an important focus area of the Ministry and a target for construction of such buildings covering a floor area of 4 million sq. m. has been proposed for the Eleventh Plan.

Manufacturing & Services

10. There are 61 BIS approved manufacturers of solar water heating systems based on flat plate collectors (FPC) and 51 MNRE approved suppliers of evacuated tube collector (ETC) based systems. They are eligible to supply solar water heating systems under the interest subsidy scheme. Regular interactions are organized with manufacturers to review the progress, plans, quality aspects, cost levels, technology and service upgradation, dealer network etc. Links to the manufacturer's websites have also been given on the Ministry's website in order to provide detailed information to prospective users. In order to promote technology upgradation in industry, soft loans are available to manufactures towards improvement in technology, expansion in production facilities etc. at a reduced interest rate through IREDA, with interest subsidy provided by MNRE. Visits abroad by industry delegations, including participation in fairs, to provide exposure to new materials, advanced technology and more efficient manufacturing techniques can also be partially supported by MNRE.

11. Development of small businesses for system installation, service and repair are being encouraged. Installers are to be trained in proper installation and plumbing work to ensure trouble-free operation of the systems. Training would also be required for development of entrepreneurs for marketing, business development etc. Support is available for training programmes for different stakeholders including trainers; installation and service personnel such as plumbers, mechanics etc; and, for entrepreneurs.

12. Akshay Urja Shops are being established for sale and service and repair of various renewable energy systems and devices including solar water heating systems. 284 shops have already been established or are being set up in various States. Soft loan assistance is provided through IREDA for establishment of the shops and a recurring grant and incentive links to turnover is also available during the first two years of operation.

13. MNRE support is also available for analytical studies aimed at catalyzing spread of proven technologies and induction of new technologies; technology/potential assessment; performance surveys; cost-benefit analysis; environmental impact assessment; consultancy,

market and export development; data base development and management; and monitoring and evaluation.

Mainstreaming of Solar Water Heating

14. Solar water heaters have become popular in Bangalore, Pune and several other cities in Karnataka, Maharashtra, Gujarat, Tamil Nadu and Andhra Pradesh. The coverage needs to be extended to other States and cities too. Efforts are being made to promote solar water heating systems in hotels, hospitals and in industrial and commercial establishments. Various user ministries such as Urban Development, Civil Aviation, Tourism, Youth Affairs and Sports, Health, Defence, Railways, Textiles etc. have been approached for adoption of solar water heating as part of the energy infrastructure under their respective sectors. Solar water heating among other renewable energy systems will also be a part of the infrastructure and services for the upcoming Commonwealth Games to be held in Delhi in 2010.

15. Efforts are being made to mainstream incorporation of solar water heating systems in design of new buildings and housing complexes, as well as to integrate these systems in existing buildings through awareness campaigns and guide-books and design aids for planners, architects, developers, builders, engineers etc. In view of the interest in installation of individual and centralized solar water heating systems in multi-storeyed housing complexes, guidelines for installations in high-rise buildings have been prepared. Housing loan financing institutions/ companies are being persuaded to include the cost of solar water heating systems in the loans provided for new housing construction as one of the conditions for granting loans. Rebate in personal income tax has been proposed for installations in homes.

16. To cope with the rising demand of electricity in our towns and cities, especially during peak hours, the Ministry has recently launched a new scheme on 'Development of Solar Cities'. The scheme is aimed at assisting cities in assessing their present energy consumption and preparing action plans/ setting clear targets for generating and conserving energy utilized in conducting urban services through energy efficiency and renewable energy interventions, including installation of solar water heating systems. Financial support is available to the urban local bodies for preparation of a Master Plan, setting up of a 'Solar City Cell' and various other support measures. 60 such solar cities are planned to be developed during the 11th Plan.

Publicity & Data Management

17. Extensive publicity and awareness campaigns are taken up through print and electronic media in a large number of cities in various States where potential for installation of solar water heating systems is high. Manufacturers are also provided support for publicity. A large number of seminars, workshops and business meets are organized with different stakeholder groups with focus on accelerating solar water heater deployment in different sectors. Awards have been instituted for best manufacturers and banks/ branches for outstanding performance during a year.

18. Data on cumulative installations on an annual basis is at present compiled based on the information provided by the manufacturers and the suppliers of the solar water heating systems. However, the Ministry aims to develop a Management Information System (MIS) wherein State/City-wise data on installation of the systems will be compiled and analysed based on the information received from different stakeholders including manufactures, suppliers, IREDA, banks/FIs, and State Nodal Agencies.
