



Ministry of New and Renewable Energy  
Government of India



## Project Summary

# MARKET ASSESSMENT OF SOLAR WATER HEATING SYSTEMS IN FIVE POTENTIAL STATES/NCR REGION

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Prepared By:



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knowledge solutions  
[www.greentechsolutions.co.in](http://www.greentechsolutions.co.in)

## Project Team

### *Core Team*

**Dr Sameer Maithel**

*Greentech Knowledge Solutions (GKS), New Delhi*

**Mr Shailesh Modi**

*Fourth Vision Consultants (FVC), Ahmedabad*

**Mr Minhaj Ameen**

*EvaluateS, Auroville*

**Mr Prashant Bhanware**

*GKS, New Delhi*

**Mr Rahul Rai**

*GKS, New Delhi*

### *Regional Teams*

#### North

**Dr Sameer Maithel, Mr Prashant Bhanware, Mr Gaurav Malhotara & Mr Rahul Rai**

*GKS, New Delhi*

**Mr Richard Sequeira**

*Solenge India, Gurgaon*

#### South

**Mr Minhaj Ameen, Mr Arijit Mitra, Mr Erik Conesa**

*EvaluateS, Auroville*

#### West

**Mr Shailesh Modi, Mr Vimal Suthar, Mr Mihir Vyas,  
Mr Vipin Thakur, Prof. Mahesh Shelar, Mr Haresh Patel**

*FVC, Ahmedabad*

## **Market Assessment of Solar Water Heating Systems in Five Potential States/NCR Region**

### *Objective*

The country-wide Market Assessment Study of Solar Water Heaters carried out in 2009 under the UNDP/GEF Project identified high potential States and Regions. This study focuses on five states/regions which are likely to contribute 49% of the SWH realizable potential up to 2022. These are:

- Maharashtra
- Gujarat
- Tamil Nadu
- Andhra Pradesh
- National Capital Region (NCR)

The specific objectives of the study are:

- Understanding the hot water demand; penetration and economics of solar water heaters in the identified States/ NCR Region and high potential cities covering residential, commercial and institutional sectors.
- Projection of future demand and assessment of the realizable market potential for 2013, 2017 and 2022.
- Preparation of Action Plans for the States / NCR region for increasing the penetration of SWH systems.

## *Methodology*

In addition to secondary research, we utilized the following instruments for the study:

- Interaction with stakeholders in 15 cities – SWH manufacturers, dealers, integrators, SNA-officials, municipal corporation/urban development authority officials, real estate developers, architects, bank managers, dealers of competing water-heating devices.
- Primary survey of 480 residential users and non-users of SWH and 405 non-residential users and non-users of SWH.
- 100 case-studies of SWH-users-households, hotels, hospitals, hostels, institutions, swimming pool etc

The analysis integrates findings from above streams of fieldwork. Once the draft findings were ready, we organized stakeholder consultation workshop at Pune, Ahmedabad, Chennai and Hyderabad and the feedback/suggestions were incorporated in the report.

## *Approach to Demand Projection*

The current level of SWH penetration vis-à-vis the key segment in the 15 cities is the beginning premise. The segments are:

- Independent housing
- Apartment housing
- Hotels/guest-houses
- Hospitals
- Hostels/other establishment

The work on industrial segment was carried out under a separate MNRE-sponsored study. For other five segments, our projection utilizes current level of segment-specific SWH penetration and the following parameters:

- Climate
- Public awareness
- Economic viability of SWH
- Public policy
- Credit status/culture
- Supply and maintenance conditions

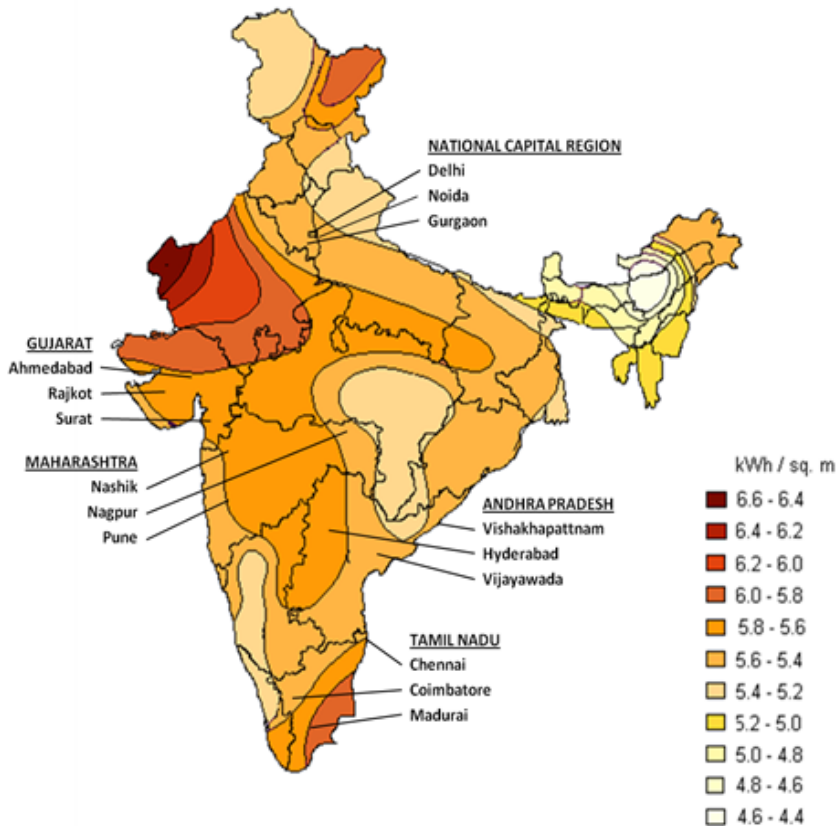
### *Lead Cities for the Study*

We have based our market-assessment on extensive secondary research for the whole state and primary research focused on 15 cities. A demographic perspective on these cities is given in the table and these cities are shown on the solar radiation map of India below:

	Population (actual and estimated, lakh)			Estimated Decadal Growth (%)	
	2001	2011	2021	2001-2011	2011-2021
Ahmedabad	46	69	90	50	30
Surat	28.76	46.73	69.48	63	49
Rajkot	9.67	15.7	22.15	62	41
Nashik	10.77	17.5	26	62	49
Nagpur	20.48	28.6	36.08	40	26
Pune	-	61.1	84.8	-	39
Hyderabad	70	77.2	91.2	10	18
Vijayawada	10.33	14.47	19.91	40	38
Vishakhapatnam	22.02	30.58	34.99	39	14
Chennai	82.4	88.79	111.97	8	26

Madurai	9.29	12.82	14.56	38	14
Coimbatore	9.3	10.91	12.88	17	18
NCR	371	486.19	641.38	31	32
Delhi	138.5	179.9	234.8	30	31
Gurgaon	-	26	37	-	42
Noida/Greater Noida	6.05	13.00	24.00	115	85

\* 2011 and 2021 populations are estimates; similarly 2001-11 and 2011-21 growth rates are estimates.



## *Existing SWH Installed Capacity*

The market- assessment underscores the following volume of present SWH base (2010). These volume estimates are based on information collected from SWH manufacturers, dealers, and associations representing end-user segments, SNAs and assessment of the field teams.

	SWH Installation (m <sup>2</sup> )				
	Residential	Hotels	Hospitals	Hostels+ Others	Total
<b>Gujarat</b>	1,30,000	7,000	2,000	11,000	<b>1,50,000</b>
<b>Maharashtra</b>	6,27,000	15,000	4,000	15,000	<b>6,61,000</b>
<b>Andhra Pradesh</b>	42,000	14,000	4,000	11,000	<b>71,000</b>
<b>Tamil Nadu</b>	74,000	36,000	3,000	2,000	<b>1,15,000</b>
<b>NCR</b>	16,000	7,000	16,000	21,000	<b>60,000</b>
<b>TOTAL</b>	<b>8,89,000</b>	<b>79,000</b>	<b>29,000</b>	<b>60,000</b>	<b>10,57,000</b>

## *SWH Demand Projections*

SWH demand projections for 5 states/NCR region and the selected cities has been done under three scenarios: Business As Usual Scenario, Optimistic-I Scenario & Optimistic-II scenario.

BAU Scenario: It assumes 15% annual growth in SWH installations based on all-India historical trend between 1995 and 2010.

Optimistic-I Scenario: Under this scenario, higher annual growth rates of 16.6% to 18.8% are considered. The growth rate for each state/region is calculated based on improvements in economic viability, policy & enforcement, supply chain and access to credit.

Optimistic-II Scenario: This scenario is built from the demand side. Under this scenario, it is assumed that:

- In commercial sector due to demand creation and effective implementation of mandatory provisions the SWH penetration would reach to 50% in each state/NCR region in hotel, hospital and hostels by 2022.
- In residential sector, we have assumed that the mandatory provision for SWH would be better implemented. The implementation period is considered as 2 years. So, from 2013 onwards, 10% of all the new households would have a SWH system installed. The sales ratio for new to existing household would be 80:20.

The results are summarized in tables below:

**SWH Demand Projection (Cumulative installation in m<sup>2</sup> of collector area)**

States	Scenario	Demand Projection			
		2010	2013	2017	2022
Gujarat	BAU	1,50,000	2,28,000	3,88,000	7,65,000
	Optimistic-I	1,50,000	2,32,000	4,29,000	9,39,000
	Optimistic-II	1,50,000	2,89,000	6,55,000	11,74,000
Maharashtra	BAU	6,61,000	10,04,000	17,56,000	35,18,000
	Optimistic-I	6,61,000	10,27,000	9,68,000	44,08,000
	Optimistic-II	6,61,000	10,68,000	18,80,000	31,33,000
Andhra Pradesh	BAU	71,000	1,06,000	1,86,000	3,73,000
	Optimistic-I	71,000	1,08,000	1,99,000	4,12,000
	Optimistic-II	71,000	1,49,000	4,21,000	8,93,000
Tamil Nadu	BAU	1,15,000	1,76,000	3,07,000	5,85,000
	Optimistic-I	1,15,000	1,79,000	3,38,000	6,74,000
	Optimistic-II	1,15,000	3,08,000	9,43,000	18,05,000
NCR	BAU	60,000	88,000	1,36,000	2,06,000
	Optimistic-I	60,000	91,000	1,50,000	2,67,000
	Optimistic-II	60,000	2,03,000	7,34,000	15,76,000

*Note: All the figures given above have been rounded off to nearest thousand. Industrial sector projections are not included here.*



## *Action Plan*

The primacy of residential sector is to continue. The importance of apartment segment within the residential sector is growing sharply; and SWH trade/policy action-barring Pune and parts of Maharashtra-are yet to address this segment effectively. The growth of SWH in non-residential sector has occurred largely on the intrinsic strength of the product and to some extent because of policy action. It is important to note here that mandatory policy will have to be accompanied by awareness creation among end uses and ironing out processing of subsidies to reduce the turnaround times to prevent these policies from backfiring like it happened in Andhra Pradesh. We have formulated a five-pronged action plan; keeping in view this above backdrop of market status. The plan consists of:

- Policy action
- Action on apartment market segment
- Credit market development
- Promotional action
- Capacity building

The action plan is addressed primarily to MNRE, SNAs and the UNDP-GEF project.

- 1. Campaign for SWH in Hotels, Hospitals and Hostels in major cities:** The commercial viability and acceptance of SWH is highest in the commercial buildings. However, the untapped potential of SWH particularly in hotels and hostels is significant, because of new capacity addition as well as increase in demand for hot water per capita. It is suggested that a focused campaign can be taken up in these segments to further deepen the market for SWH.

- 2. SWH in Multi-storey housing:** At Rajkot, in the last two years, several SWH systems have been installed in multi-storey housing as a part of mandatory regulations of the Municipal Corporation. It is important to monitor the performance and user experience at Rajkot to ensure that the SWH trade and Municipal Corporation at Rajkot learn quickly from this experience. A best-practice manual on SWH systems for multi-storey buildings can be prepared. The manual would be targeted to builders, architects, engineering consultants & Municipal Corporation officials. There is a need to sensitize the developers and builders about potential and usefulness of SWH in multi-storey housing in each of these cities.
- 3. Revision of bye-laws for making SWH use mandatory:** With very large construction planned at across all major cities, one of the highest priorities should be revision of bye-laws for making SWH use mandatory in commercial and residential buildings. The experience at Rajkot of mandatory regulation has been positive. The mandatory regulations should be implemented only after sufficient awareness and positive experience about the technology has been created in the city. It is also important that the mandatory regulation should be practical, take into account the local conditions and provide clear guidelines for all categories of buildings. It is best if key stakeholders are consulted during its formulation.
- 4. Bank credit:** So far bank credit has not been a major factor in the dissemination of SWH technology. The experience of SWH in some cities of Maharashtra (e.g. Nashik and Nagpur) shows that access to bank credit has a very positive impact on SWH market, particularly for sales made to individual houses belonging to middle and lower-middle income class. Identifying and mobilizing at least one-bank in each region focusing on providing credit for SWH should be targeted.

5. **Campaign to target tourist/religious centers** – Tourists and religious centers have a large potential for SWH. A campaign to target these centers can be undertaken to deepen the penetration of SWH technology in this segment.
6. **Training of Technicians:** During the state-level stakeholder interactions, shortage of trained technicians was identified as a barrier in the expansion of solar water heater market. It is suggested that MNRE, MEDA along with the manufacturer’s associations (STFI, MSMA) and technical institutions should organize training programmes for technicians.



## **Greentech Knowledge Solutions Pvt Ltd**

Greentech Knowledge Solutions Pvt. Ltd. (GKSPL) offers research and consultancy services for deployment of energy efficiency and renewable energy solutions. Solar thermal is a focus area of work at GKSPL. GKSPL is credited with conducting the first-ever market assessment study on solar water heating in India. GKSPL has been actively working for the promotion and deployment of Solar Water Heating in industrial, commercial, institutional and residential sectors. The range of services offered include: feasibility studies, Detailed Project Report (DPR) preparation, project management support, market research, policy advice and training services.

### **For more information, please contact**

Dr Sameer Maithel

Director

Greentech Knowledge Solutions Pvt Ltd.

342, Abhiyan Apartments, Plot 15,

Sector 12, Dwarka, New Delhi – 110078

E-mail: [sameer@greentechsolution.co.in](mailto:sameer@greentechsolution.co.in)

Mobile: +91 9811392256

Telefax: +91 11 45535574

Web: [www.greentechsolution.co.in](http://www.greentechsolution.co.in), [www.gkspl.in](http://www.gkspl.in)