



PREPARATION OF DATABASE OF KEY INDUSTRIAL INSTALLATIONS OF
SOLAR WATER HEATING SYSTEMS (SWHS) ACROSS THE COUNTRY AND
SUPPORTING THE DEVELOPMENT AND DISSEMINATION OF
CASE STUDIES OF SUCCESSFUL INSTALLATIONS
(INCLUDING WEBSITE DEVELOPMENT)

STAKEHOLDERS MEETING

16TH OCTOBER 2014

SOLAR PROCESS HEAT (SOPRO-INDIA)
INDO-GERMAN ENERGY PROGRAMME (IGEN) – RENEWABLE ENERGY
BENEFITS OF OPTIMIZATION OF SOLAR WATER HEATING SYSTEMS IN INDIAN INDUSTRIES

Scope of the Study

- To develop a list of industrial SWHS installations in India with basic information, which is to be submitted to GIZ in the form of a database.
- A recommendation of which installations should be taken up for showcasing as successful case studies is to be provided.
- Gather detailed information on the 20 selected case studies of SWHS installations, followed by support with the planned awareness building activities.

The activities are to be carried out in two Phases

Activity 1: Study of Solar Water Heating Systems

Activity 2: Assistance Fraunhofer ISE for identification and Monitoring System

Activity 3: Development & Hosting of Web Site



Our Approach

- Interacted with Manufacturers and sought list of 38 plants above 5000 L
- Collection of basic data of 30 SWHS systems in the industries
- Discussion with GIZ and Fraunhofer to finalise initial parameters
- Basic information on Type, Location, Capacity & manufacturer carried out
- Finalized 27 SWH Systems Plants and visited the same
- Collection of information as per standard checklist, understanding the processes, applications, and operation of system

Our Approach

Criteria for Selection on Plants

- **SECTORS**
 - Dairy, Automobile, Chemicals & Pharma, Glass fibre, Textiles, Metal based, Paints, Refrigeration manufacturing, Capsules, Food Processing, Leather
- **MANUFACTURERS**
 - Kotak Urja, Photon Solar, Inter Solar, Akson Solar, Tata Solar, Urmi Solar, SLT Energy, Electrotherm, Racold, Solar Hitech Geysors, Rashmi Solar
- **TYPE OF PLANT**
 - Flat Plate Collector, Evacuated Tube Collectors
- **BUSINESS MODEL**
 - Owned System, RESCO based Systems
- **BASE FUEL DISPLACEMENT**
 - Furnace Oil, Diesel, Electricity, Fire Wood, Biomass, Coal

Sectors & Applications of SWH Systems

Sector	Application	Plants
Dairy	<p>Preheating of boiler feed water used for washing of milk cans and chilling / storage tanks at Dairy Plants, Chilling Plants</p> <p>Providing steam for production of Cattle Feed Pellets</p> <p>Steam used for Pasteurization, Production of Milk Products like Ghee, Butter etc in double jacketed vessels</p>	<ul style="list-style-type: none"> - HP Dairy, Shimla - Milk Chilling Plant, Dausa - Milk Chilling Plant, Rajasmand - Cattle Feed Plant, Ahmedabad - Dudhsagar Dairy, Mehsana - Chilling Plants, Uttam Dairy - Milma Dairy, Pallakad - Aavin Dairy, Tiruvelneli - Anchal Dairy, Dehradun, (Dismantled, Old Plant)
Automobile	Hot water for degreasing of Parts and Components	<ul style="list-style-type: none"> - Sono Koyo, Sripermbudur, TN - Wheels India, Padi, TN (Both on RESCO mode)
Aluminum Extrusion	Hot water for degreasing of Aluminium containers for process improvements in quality of product	<ul style="list-style-type: none"> - Bharat Containers plants at Nagpur (Aerosol /soft drink cans)

Sectors & Applications of SWH Systems

Sector	Application	Plants
Pharma	Boiler feedwater for generation of steam used in process vessels	<ul style="list-style-type: none">- Synthokem Lab's two plants at Hyderabad- Plethico Pharma , Indore- Vippy Solvex, Indore (Dismantled) – Old Plant- Ranbaxy, Taonsa, Punjab- Kangaroo Staplers, Ludhiana
Pesticides	Boiler feedwater for generation of steam used in process vessels	<ul style="list-style-type: none">- Excel Crop Care, Bhavnagar
Food Products	Hot water for Preparation of Sugar Syrup used in Biscuit Production	<ul style="list-style-type: none">- Parle Biscuits, Neemrana, Rajasthan
Synthetics	Boiler Feed water for Washing during production of Capsules	<ul style="list-style-type: none">- Sunil Health Care, Alwar

Our Approach

Sector	Application	Plants
Textiles	Feed-water to Boiler for hot water used in washing of apparels Steam for sizing Hot water for dyebath	- Chelsea Textiles, Gurgaon - Kanswa Textiles, Solapur, Maharashtra
Paints	Hot water for process requirements in paint production Washing of vessels	- Asian Paints, Rohtak (Under refurbishment with SS piping for attaining process quality water)
Glass Fibre	Mixing of Chemicals in Hot water for production of glass fibre	- OCV Reinforcements, Hyderabad
Shoes	Boiler Feed water	-Drish Shoes, Nalagarh, HP (Dismantled)

General Observations

- Sought plants list of 38 from various manufacturers,
- Visited 27 plants of which 20 are operating, 3 dismantled, 4 not operating
- Scheduled to visit 4 plants which are operating
- One plant is under refurbishment
- Plants range from 5000 LPD to 105000, LPD
- Overall plants are functioning well as per the expectation of plant owners
- General observation is that plants do not have specific manpower to maintain the plant, data, or log books, as they consider the plant to give desired results as also, they are busy with their production and satisfied with the service delivered by the installations. A working manual would add value in data capture.

General Observations

- In some cases the engineering division personnel have taken care to optimize their needs, as also they have gone for refurbishments
- Additional costs have been incurred by industries for structures on the roof tops which is quite a substantial component
- Plants which are dismantled are old plants above 15 years
- Plant generally has payback within 2 to 3 years of time
- Most of the plants are not pressurized
- Most of the SWH Systems are maintained manually by the boiler staff, while very few systems have Differential Temperature Control (DTC) and automation

General Observations

- Use of Heat Exchanger Systems and recirculation for additional throughput is observed in very few of the systems
- Some of the Solar Tanks have been fitted with electric heating systems but are not in use.
- While some solar water tanks are designed with heat exchanger systems
- Fuel Displacement through SWH System is in the range of 5 to 10 % in case of boiler feed water systems, direct hot water it is upto 30 %



Thank You