Solar Water Heating in Hospitals

Case studies from Hospitals in NCR

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DSCL Energy Services Company Ltd-An overview
Solar Water Heater’s working system

Principle: Black Body Heat Absorption

Working: Black Collector surface absorbs heat energy from Sun and transfer to water which is passing through the collector tubes.
Challenges for Solar Hot Water systems in Hospitals

- High Initial Cost
- Water quality
- Consumption pattern for hot water usage is uncertain
- Sizing of SWH system – balance between cost and usage
- Piping & Distribution of hot water system – Execution without disturbing primary healthcare functions
- Operation and Maintenance of the system
- Back up support for critical applications like OTs and Emergency ward
Potential for use of SHW systems

- @ 140 Million sq.m of collector area installed for SHW in India
- Primary use for washing & bathroom
- Emergency and Operation Theaters
- Replacement of steam / electrical heaters
- Non intrusive and simple in operation
- Can be used for central comfort conditioning system
- Can be used for VAM cooling for cold rooms
What is an Energy Savings Performance Contracting?

- ESCO finances, install and maintain new energy efficient equipment in Client’s facilities during the concession period.
- No up-front cost to the Client.
- The ESCO is paid back over time from the verified energy and maintenance cost savings.
- Savings are contractually guaranteed and mechanism of making up for any short fall by the ESCO is well defined.
- Client gets the project free of cost after the concession period.
- Client provides payment security to ensure timely cash flow to ESCO.
- ESCO system highly successful in many countries-BEE promoting the system in India for targeted energy efficiency delivery particularly in the building sector.
How does an ESCO do it?

- A qualified ESCO can put the pieces together:
  - Identify and evaluate energy-saving opportunities;
  - Develop engineering designs and specifications;
  - Manage the project from design to installation to monitoring performance after implementation;
  - Arrange for financing;
  - Train your staff and provide ongoing maintenance services;
  - Guarantee that savings will cover all project costs
Repaying a part of generated cost savings as compensations to ESCOs
Performance Contract Process

Benchmark Audit
- Assessment of measurement system
- Validation of benchmark audit
- Preparatory work for IGA
- Audit based on client's data done for the purpose of quote

Walk Through Audit
- Detailed assessment including project configuration, development of baseline & M&V plan, project costing and financial analysis

Investment Audit
- Letter of intent from client
- Finalization of implementation mechanism (performance contract), financing mechanism including savings sharing mechanism.
- Development and signing of performance contract

Project Development
- Signing of baseline & M&V document
- Detailed engineering
- Financial closure
- Procurement
- Installation & commissioning
- Measurement & Verification
- Management Information System
- Training

Project Implementation
- Sustenance Support
- Operation & Maintenance
- Project cash flow

Concession period.

Case Study -1

Government Hospital in NCR

Total Carpet area – 151,194 Sq. M

Air Conditioned area – 85573 Sq. M

1763 beds

Occupancy level – 80 %
Hot water consumption trend *

* Based on DSCLES actual measurement
## Proposed SHW system

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<thead>
<tr>
<th>Sr.</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>1</td>
<td>Capacity</td>
<td>18,000 LPD</td>
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<tr>
<td>2</td>
<td>No. of Elect Geysers to be replaced</td>
<td>256</td>
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<td>3</td>
<td>Electrical Energy Saving</td>
<td>92,000 kwh / year</td>
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<td>5</td>
<td>Monetary Saving</td>
<td>4.1 Lac Rs. / year</td>
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<td>6</td>
<td>Estimated project Cost with RO water system and piping</td>
<td>86.92 Lac Rs. / year</td>
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</table>
Case Study -2

Government Hospital in NCR

Total Carpet area – 20,240 Sq. M

Air Conditioned area – 3,678 Sq. M

223 Beds

Occupancy level – 87 %
Hot water consumption trend

General Ward / Bed Trend

Private room / Bed Trend

* Based on DSCLES actual measurement
## Proposed SHW system

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<th>Sr.</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>1</td>
<td>Capacity</td>
<td>2,000 LPD</td>
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<td>No. of Elect Geysers to be replaced</td>
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<td>3</td>
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<td>34,000 kwh / year</td>
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<td>Monetary Saving</td>
<td>1.69 Lac Rs. / year</td>
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<td>Estimated project Cost with RO water system and piping</td>
<td>14.09 Lac Rs. / year</td>
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Case Study - 3

Government Hospital in NCR

Total Carpet area – 12,144 Sq. M

Air Conditioned area – 1,046 Sq. M

248 Beds

Occupancy level – 87 %
Hot water consumption trend *

**General Ward / Bed Trend**

![Graph showing hot water consumption trend for general ward/bed]

**Private room / Bed Trend**

![Graph showing hot water consumption trend for private room/bed]

*Based on DSCLES actual measurement*
Proposed SHW system

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<tbody>
<tr>
<td>1</td>
<td>Capacity</td>
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<td>No. of Elect Geysers to be replaced</td>
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<td>6</td>
<td>Estimated project Cost with RO water system and piping</td>
<td>10.07 Lac Rs. / year</td>
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</table>
DSCL Energy Services Co Ltd

- Set up in February 1999 to leverage in-house expertise and competence in Energy Management and Power Generation

- Our Core Values
  - Service
  - Commitment
  - Innovation
  - Excellence in Knowledge
  - People Development

- Empanelled with
  - World Bank
  - Asian Development Bank
  - Department For International Development, UK
  - BEE, India
  - Petroleum Conservation Research Association
  - Power Finance Corporation Ltd.
  - Tamil Nadu Electricity Board
  - Gujarat state Electricity Board

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BEST ENERGY SERVICES COMPANY AWARD
From PCRA, MoP&NG

Undertaken more than 300 EE studies in various sectors in India and abroad. Successfully completed the first ever financed ESCO project in India at NDMC, New Delhi. PC Shared Savings project at various government hospitals under progress. More than 20 PC projects in Industrial sector.
Thank You