

## News for the month of March 2015

### JBM group explores solar thermal for processing



The US\$ 1.2 billion, JBM Group is a diversified conglomerate with presence in automotive, engineering & design services, renewable energy and education sectors. The group philosophy is that sustainability is the way of doing business

For their various pre-treatment processes of automobile components for two-wheelers at their Gurgaon works, known by Neel Metal Works, they require hot water in their process with temperatures varying from 50 °C to 60 °C before subjecting them to painting. In order to maintain the above temperature, Liquefied Petroleum Gas (LPG) fired hot water generator is operated between 65°C to 70°C in summer and at 90 °C to 95 °C during winter.

In view of their philosophy of sustainable energy development, hence to reduce the consumption of LPG gas, they recently commissioned a non-imaging concentrator solar thermal system for meeting the hot water requirements. The Rs. 1.2 crore project consists of 180 collectors covering a total collector area of 610 m<sup>2</sup> and is supplied by Thermax India Ltd. This is a pilot project commissioned and based on the success they would like to replicate in all their other 34 plants.

As per a company spoke person “We had studies extensively all the technologies and since our requirement of hot water was for 90°C hence the non-imaging system ideally suited hence we opted for it.”

The system is integrated in their existing process of hot water hence avoided the need to have separate hot water storage system. It is anticipated to save 130 kgs of LPG on a normal sunny day. Based on their annual process it is anticipated that the system will pay back within 4 years after taking into account the central government . subsidy and additional UNDP-GEF CST project support.

To ensure trouble free operations they have entered into an annual contract with Thermax Ltd. and it is hoped that with growing time as fuel costs would rise the result will justify the use of solar thermal system.

<http://www.jbm-group.com>

## Hospital commissions solar thermal system for laundry



PSG Hospitals, Coimbatore have been recently credited with green hospital award from Association of Healthcare Providers India Limited (AHPI) for their contribution towards their renewable energy use, energy management and for implementing several other green processes. One of the projects to have implemented is a 100 m<sup>2</sup> parabolic trough concentrated (PTC) solar thermal system for supplementing steam to their drying processes in laundry at an estimated cost of close to Rs. 23 lakh. The conventional method used for drying was through two numbers of 120 kVA diesel generators hybridized with electric heating.

Greenera Energy India Pvt. Ltd. who commissioned the system carried a detailed analysis of the operation of the laundry process from the point they receive the clothes from the hospital wards till it is ready for dispatch. They studied the pattern of energy usage annually and the fuel used for meeting the heating demands. Based on their investigation they suggested the use parabolic trough concentrator(PTC) seamlessly hybridised with electric boiler for supplying the steam for drying process. The solar thermal has resulted in complete elimination of one diesel generator besides the other system is only used during when demand rises.

In the first phase they put up a 50 m<sup>2</sup> parabolic trough collector during September 2014. The results were encouraging and the second phase of 50 m<sup>2</sup> was recently completed in February 2015.

According to V.K. Valliappan of Greenergy "The secret of savings from a solar thermal collector lies at increasing its effective hours of solar delivery." From 200 litres per day the diesel consumption has come down to 64 litres when bright sunlight is available.

PSG Hospitals authority claim to have achieved savings worth Rs. 1 lakh per month and they estimate the system to pay back within 2 years after accounting for the central government subsidy and additional UNDP support.

<http://www.psghospitals.com>

## Workshop serves an eye-opener in Peenya Industrial Association



As a part of its series of six assignments on "Market development of CSTs for process heat/cooling applications in the industrial sector" Pricewaterhouse Coopers (PwC) organized its last workshop at Peenya Industrial Association (PIA), Bengaluru. PIA is amongst the biggest associations in South Asia, with a membership of about 6,000 industries including major several automotive and textile industries.

Vibhash Garg, PwC depicted that Bengaluru had high DNI values that were around 30% above what is generally considered suitable for solar energy installations. He explained the working and temperature specifications of a parabolic trough, solar dish, Linear Fresnel, Scheffler Dish and Non Imaging Concentrators and their applications for process heat and cooling. He depicted through examples the financial analysis of concentrated solar technologies in refluxing, spray drying and cleaning in place (CIP) processes in the Chemical/Pharmaceutical sector. This analysis detailed the surface area and investment required, the fuel savings made per day and also the payback period of the technology in order to better provide an idea to the participants.

Pankaj Kumar from UNDP-GEF project presented with the achievements since the programme started in April 2012. He informed that about 160 systems with 32,000 square meters of collective area of concentrated solar thermal systems are commissioned in India. He also showed a sample cost benefit analysis depicting a payback period of 3-5 years of a typical concentrated solar thermal system when substitutes diesel or Liquefied Petroleum Gas. He explained in detail, the financial support given to different types of projects with different specifications both by MNRE and UNDP and also the accelerated depreciation benefits offered. He also shared with the participants the highlights of certain projects in various industrial segments and regions and provided the methodology for obtaining support.

Unisun Technologies and A.T.E. Enterprises Pvt. Ltd Channel Partner of MNRE presented their case studies of prominent installations which aided in convincing the participants to consider such solar thermal systems

The workshop certainly proved an eye-opener to the participants of PIA as it answered the concerns related to fuel savings, area requirement, advantages of using CSH systems, profitability against MNRE capital subsidy and UNDP-GEF support, etc. PIA vice-president Jayaramu in his speech assured that if couple of success stories can be implemented in their region it will serve as evidence to the remaining industries to readily take up similar projects.

<http://www.cshindia.in>

## Boost to 'Make in India' crusade



The Union Budget 2015-16 presented by Shri Arun Jaitley, Union Finance Minister as it provided clarity and direction to the ambitious renewable energy targets being announced by the ruling government, since it took charge in May 2014. The Minister reiterated the intention to target 175,000 MW of Renewable Energy capacity by 2022 - 100,000 MW solar, 60,000 MW wind, 10,000 MW biomass and 5,000 MW small-hydro. There was equally news to cheer for the solar thermal industry by announcing waiver of duties and excise.

To make better "Make in India" the basic custom duty is fully exempted on evacuated tubes with three layers of solar selective coating for use in the manufacture of solar water heater and system with the aim to reduce the cost of raw materials. This will give fillip to the manufacturing industry. Presently the basic customs duty on tubes ranges between 7.5% to 10% depending on the HS (Harmonized System) code. This step will safeguard the import of spurious evacuated tubes and ensure quality. Besides it will also result in cost reduction of the final product. The non-imaging system manufacturers are likely to benefit.

Excise duty structure **on** Solar water heater system and parts for use in manufacture of solar water heating system **are restructured** from 12% to Nil without CENVAT credit or 12.5% with CENVAT credit. Under the Cenvat Scheme, a manufacturer of final product or provider of taxable service shall be allowed to take credit of duty of excise as well as of service tax paid on any input received in the factory or any input service received by manufacturer of final product.

Customs duty on steel imported in the country has been however raised to 15% from 10% to protect domestic manufacturing.

The cess on coal has been doubled from Rs. 100 to Rs. 200 per metric ton of coal to promote clean energy initiatives and fund research in clean energy technologies. This will fetch additional funds close to Rs 12,000 crore annually in the NCEF pool and it needs to be seen how the renewable energy sector benefits from this. There is already a huge backlog of pending subsidies that the government owes to its Channel Partners. Solar Water Heater industry itself accounts for pending claims of close to Rs. 400 crores.

An announcement of 'Atal Innovation Mission (AIM)' with an initial fund of Rs 150 crore for research and development. It will foster a culture of innovation, research and development and scientific research in India involving academics, entrepreneurs and researchers. The need was felt to encourage interactions between industry, university, researchers and different players to commercialize technologies so that more entrepreneurs are nurtured. The solar thermal sector still offers huge potential for research and development in improvising the quality of product and AIM is ideally suited.

<http://www.cbec.gov.in/ub1516/do-ltr-jstru1.pdf>

<http://www.cbec.gov.in/excise/cx-act/notfns-2015/cx-tarr2015/ce12-2015.pdf>

## Motivational workshop captivates young minds



Promoters, Researchers & Innovators in New & Clean Energy (PRINCE) organized a networking Workshop for 'Entrepreneurship in Renewable Energy' in Dhule, Maharashtra focused on solar thermal cooking . According to Dr. Ajay Chandak, founder of PRINCE "PRINCE follows the philosophy that the best way to promote renewable energy is to develop entrepreneurs in this field and training workshops for such entrepreneurs is one of the best solutions."

56 Participants from all over India, from Kolkata, Bhubaneswar, Hyderabad, Mumbai, New Delhi, Rajkot, Ahmedabad etc. from almost 12 states participated in the workshop. The formal inauguration of the workshop was done by cutting cakes made in 'Solar Cookers'. It provided field demonstrations of various models of solar thermal cooking developed from domestic as well as community use. The participants were also presented with case studies of industrial process heat. Demonstration on how biogas plants, wood gasification systems can also be used in hybrid mode with the concentrating solar thermal system to enhance the efficiency of operation was also made.

Keeping in line with the workshop theme to demonstrate sustainable cooking the lunch served during the workshop was cooked using solar thermal cooking means.

Ankit Ramoliya an engineer and a first generation entrepreneur from Surat found the workshop amazing to mingle with like minded people. "I also made strong networking during workshop and was the biggest take away" said Ankit.

Ganesh Kailas Badgujar from Jalgaon, Maharashtra another young entrepreneur starting his own venture in renewable energy found the platform ideal to gain knowledge on the subject and found the live demonstrations of the cookers useful and motivating.

A new solar concentrating cooker of 4 m<sup>2</sup> aperture area was introduced in the workshop. This is suitable for mid-day-meals for schools and for border security forces on desert borders.

On the occasion Executive Director of 'Solar Cooker's International, Ms Julie Greene was conferred with 'Suryamitra Award'.

India has over 1.2 million rural schools where mid day meal is required to be cooked and PRINCE would like to focus its training by exploring entrepreneurs so that solar thermal can partly fulfill the cooking energy. Similarly it would like to train the defence personnel posted on the borders for maintaining solar thermal cooking systems.

<http://www.princeindia.org>

## IREDA launches bridge loan scheme against pending subsidy



IREDA has launched a new scheme "Direct Discounting of MNRE Capital Subsidy" payable to Accredited Channel Partners approved by MNRE and State Nodal Agencies (SNA) for installation of Solar Water Heating Systems". The money will be available as bridge loan.

MNRE Accredited Direct Channel Partners (DCP's), State Nodal Agencies (SNA) and other stakeholders as approved by MNRE, who have already submitted a valid claim of Capital Subsidy at IREDA, which is pending for release of payment on account of non-availability of funds, will be eligible under the scheme.

The amount of loan available will be up to 50% of the pending claim and the rate of interest charged will be 0.9 % per month. Loan amount to be recovered out of capital subsidy received / to be received from MNRE. Shortfall, if any, will be recovered from the borrower, which will be payable on demand.

However borrowers will have to fulfill the conditions, some of which includes Undertaking / Agreement for availing bridge loan and resolution, Copy of Memorandum of Articles (MOA) & Article of Association (AAO)/ Partnership deed, Board resolution for availing bridge loan, Declaration on letterhead about no charge on capital subsidy by any other lender, Net worth of the Directors, post dated cheques, Demand Promissory Note, etc.

0.90% p.m. (10.8% Pa) to be adjusted from the subsidy receipts from MNRE against the claim. Shortfall, if any, will be payable by the borrower on demand.

Commenting on the scheme Hemant Revankar of Bipin engineers says "It has given an interim relief as most of the Channel Partners could not further sustain collateral security to borrow loan. It is a pity that we have to pay interest on our own money that is due. However it is essential that MNRE settles all pending claims within six months else the story will be back to square one and we will again need to scramble to get funds for operating our business."

It may be recalled the DCP's and State Nodal Agencies are awaiting their subsidy claims worth Rs. 350 crore to be settled pending since June 2011 and the scheme has come as a breather to several DCP's who are already on verge of bankruptcy.

[http://www.ireda.gov.in/writereaddata/Direct%20Discounting%20of%20Capital%20subsidy\\_External%20\(Website\)\(2\).pdf](http://www.ireda.gov.in/writereaddata/Direct%20Discounting%20of%20Capital%20subsidy_External%20(Website)(2).pdf)

**Interview with Dr. Indu R. Keoti (Pillai), Senior Manager, EcoAxis Systems Pvt. Ltd, Pune on the monitoring of various concentrated solar thermal installations being undertaken as a part of UNDP-GEF CST assignment.**



***IST: Are the end users satisfied with your monitoring results?***

IRK: The different stakeholders of the monitoring system including CST site owners, manufacturers, MNRE/UNDP officials and the scientists at National Institute of Solar Energy (NISE), Gurgaon have online access to the performance data of the CST sites. We have got positive responses from the 15 CST site owners who earlier didn't have any systematic way access to the performance data. The end users have found the system useful to them in terms of the information about performance and utilization of the CST systems. For some users, the monitoring system has also helped in troubleshooting critical issues related to the CST system.

***IST: What are the real challenges you encountered while monitoring?***

IRK: During the course of the project, we have faced few challenges like:

- (a) As the sites were originally not designed to accommodate the instruments, the engineering team had a challenge to select & install the instruments.
- (b) One year after successful commissioning at two sites in Chennai, there were sudden issues with the internet availability of the chosen internet service provider. The issue was resolved by replacing the SIM card in the logger with a SIM card of a different service provider.
- (c) The shading ring of the diffuse radiation pyranometer needs to be adjusted at site every 2-3 days. We had requested all the users/ operators for their support to ensure that this is carried out. Since the response from the operators was not very encouraging, we developed a software application that analyses the global and diffused radiation data patterns and computes whether the shading is set in position. An automated email alert is sent to the site owner in case of the ring needs resetting. This has helped in keeping the user informed and thus getting the correct data.

***IST: Can you share any one experience of your clients that made them truly satisfied after your monitoring results?***

IRK: During a visit to the CST system installed at a leading automotive component manufacturer's facility, the end user complained of an error in the reading of feed water temperature which was recorded as above 100°C. When investigated, it was found that the NRV (non-return valve) of the feed water line was malfunctioning and so the steam from the steam drum was flowing back to the feed water line. The user could realize this because of the availability of the monitored data, which helped in identifying this leaking valve. After rectification, the user could arrest further loss of energy.

The end user at another manufacturing facility was really happy to have all the data of the CST system at the desktop/ laptop which have eliminated the visits that he had to make to the site everyday to monitor the performance.

**IST: What are the diverse activities you perform while monitoring?**

IRK: Once the 15 sites were finalized based on the discussions with MNRE, manufacturers & site owners, the following were the activities were carried out for installation of monitoring systems.

- 1) Basic information collection about capacity, number of dishes and P&I diagrams of the CST system from the manufacturers and end users.
- 2) Visit of EcoAxis team to each site to identify the instrumentation requirements and the locations where different instruments were to be installed.
- 3) Sharing the installation plan document including the detail specifications of the instruments, proposed location of instruments and support needed from the site, with the manufacturer as well as end user.
- 4) Installation & commissioning of the instruments and data acquisition systems at each site by EcoAxis engineers.
- 5) The data was made available online to each of the beneficiaries, manufacturers and MNRE & UNDP officials using the EcoAxis Internet of Things (IoT) technology. The data of the site is accessible only to the authorized users with login credentials.

**IST: How many installations you have studied and give their break-up?**

IRK: EcoAxis is monitoring 15 CST installations which includes

- i. 6 fixed focus elliptical dish (Scheffler) based steam generation systems for community cooking
- ii. 1 Scheffler based thermic fluid heating system for community cooking
- iii. 1 Scheffler based pressurized hot water system for cooling
- iv. 2 Scheffler based steam generation systems for process heating
- v. 1 Scheffler based hot water system for boiler feed water preheating.
- vi. 1 Fresnel reflector based dish for steam generation for community cooking
- vii. 1 Fresnel reflector based dish system with pressurized hot water system for cooling
- viii. 1 Fresnel reflector based dish for pressurized hot water for process heat
- ix. 1 parabolic trough concentrator (PTC) based hot water system for process heat
- x. 1 non-Imaging concentrator (NIC) based hot water system for boiler feed water preheating

**IST: Do you make your surveyed data public and is there any website that one can access to?**

IRK: Under the contract with MNRE, EcoAxis is providing the raw data of the weather parameters and performance parameters to different stakeholders like MNRE, 15 beneficiaries and associated manufacturers. EcoAxis has also developed a special application for MNRE, where the stakeholders can view the monthly performance report which provides daily thermal output from the system. This information is hosted on secure servers and can be accessed only by authorized users with password protected login credentials. The authority of putting data in public domain resides with MNRE/UNDP.

**IST: By when will the final monitoring be completed?**

IRK: Monitoring of the CST systems is a continuous process. The present contract with MNRE for hosting the data including analytics is for 2 years, up to December 2015. This can be extended based on MNRE's requirement.