Press Release

Ramakrishna Mission Students Home adopts solar energy for cooking

- Celebrates the 150 Anniversary of Swami Vivekananda by adopting an environment friendly cooking system – ARUN 100
- ARUN exclusively made for fulfilling the heat requirement in the domain of Community Cooking, Industrial Process Heating and Comfort Cooling

21 October 2013, Chennai: Observing the 150 birth anniversary of Swami Vivekananda, **Ramakrishna Mission Students Home** and **Clique Solar**, pioneer in developing solar technologies for Industrial Process Heating (IPH), Community Cooking and Comfort Cooling applications, launched ARUN®100 at the Ramakrishna Mission Students Home premises.

The opening was blessed by Srimat Swami Gautamanandaji Maharaj, Adyaksha, Sri Ramakrishna Math, Chennai, and launched in the presence of Mr Karunakaran, GM, TEDA.

ARUN®100 solar thermal system will provide enough steam to cook an equivalent of 3500-4000 meals (consisting of sambhar, rasam, rice, vegetables and dal) for the students and residents of the Mission daily.

Welcoming the dignitaries and guests to this dedication ceremony, Swami Satyajnananandaji Maharaj, Secretary of the Students Home, said, "Ramakrishna Mission is committed towards serving the society and the environment in which it lives. This year being the 150th year of Swami Vivekananda birth anniversary, we want to take a step forward in strengthening our commitment. We have adopted ARUN solar steam generating technology to reduce our dependency on LPG, required for cooking. By capturing solar energy and using it to convert water into enough steam, a majority of our everyday cooking requirements is fulfilled, including the morning breakfast due to the thermal storage provided with the system. It is a pollution-free and environment-friendly system and is in harmony with the principles and activities of Ramakrishna Mission."

Key Facts

- Shri Ramakrishna Mission Students Home adopts ARUN 100 to cook an equivalent of 3500 - 4000 meals at the Home daily
- ARUN focused for Industrial Process Heating and Comforting Cooling – IPH and Cooling
- ARUN is indigenously designed
  - Double axes tracking system of sun with an accuracy of more than 99.5% to intercept maximum sunlight
  - Needs ground space of 3mx3m
  - Can operate up to 300°C (oil) and 25 bar (steam).

Speaking at the inauguration of ARUN®100 cooking system, Mr Ashok Paranjape, Managing Director, Clique Solar said, "It is a matter of great pride that Ramakrishna Mission chose to adopt the 100% indigenously developed ARUN technology. I am sure this will provide a great support not only for us, but for the Concentrated Solar Thermal (CST) industry as well."

He added, "The potential of solar energy is huge, but adoption by organizations depends upon how well a given solar technology overcomes the challenges they face. Our focus has always been on identifying and addressing these challenges. The ARUN technology is India's most efficient solar thermal technology. It solves the user's three most important challenges – on demand supply of thermal energy, accuracy of thermal output in spite of the inherent variability of solar radiation, limited space availability and economics."

MNRE has provided immense support in taking the ARUN Concentrated Solar Thermal (CST) technology to the industry by way of providing financial assistance for R&D, as well as granting subsidies to the users that have installed the ARUN dish.

Need for Clean Renewable Energy at the Ramakrishna Mission Students Home:

The kitchen at the Ramakrishna Mission Students Home used LPG for firing boiler for steam cooking. We used 2 LPG cylinders (14.2 kg) per day, however given the recent rise in fuel prices LPG no longer a sustainable option. To overcome the problem of rising LPG cost, we shifted to a custom made wood burner which burnt wood very efficiently and also reduced the amount of smoke. Our cooking fuel bills were reduced to some extent.

However we looked for ways to cook food with less cost. We analyzed many options and finally decided upon ARUN100 – a solar thermal steam generation system from Clique Solar, Mumbai. This system finds many applications in Industrial process heating, cooling, desalination, cooking, milk pasteurization and effluent treatment.

This plant uses the immense power of the sun by focusing the sunlight to a central receiver. Water flowing to the receiver is heated up and converted into steam which is used for cooking. ARUN® dish is capable of moving and tracking the sun's motion (Automated Dual Axis Tracking) and thus maximizing the efficiency of the system. We are able to store steam as pressurized hot water in a tank to be used later during early morning and night time cooking. This solar thermal system can produce around 600 kgs of steam on a clear sunny day and can be used to cook around 4000 meals a day with daily energy output of 4 lakh Kcal.

Ministry of New and Renewable Energy, Government of India, provide 30% financial subsidy for the project.

About ARUN

ARUN®100 is part of the ARUN series of solar thermal systems which has been indigenously designed and developed by Clique Solar, a Mumbai based solar technology company. Currently Clique Solar offers three variants of the ARUN dish: ARUN®160, ARUN®100 and ARUN®30.

ARUN technology is based on the basic principles behind a magnifying glass and a sunflower. A magnifying glass concentrates sunlight at a single point with the help of parabolic lenses. Similarly, ARUN uses an ingenious, fresnelized mirror arrangement scheme to get a 3-dimensional parabola effect. Like a sunflower, ARUN automatically tracks the sun from sunrise to sunset on both East-West and North-South axes to intercept maximum sunlight throughout the year, irrespective of the installation location. ARUN dish is mounted on a single column, thus occupying ground area of less than 3m x 3m.It can be operated in various thermic media including steam, water, hot oil, hot air etc and reach temperatures and pressures of up to 300°C or 20 bars respectively. The lifespan of an ARUN dish is greater than 25 years.

The receiver of ARUN is designed to operate at temperatures up to 300°C. Thus, it works as a solar boiler, substituting the consumption of conventional fuels such as Furnace Oil, High Speed Diesel (HSD), Piped Natural Gas (PNG), coal, etc. which are polluting and becoming increasingly expensive. Having installed the ARUN system for varying applications in diverse industries such as dairy, automobile, chemical, etc, at reputed clients such as Mahindra, NTPC, ITC, Chitale Dairy, Akshardham, TVS Group, etc, Clique Solar has become particularly skilled in integrating the solar thermal system with the existing industrial processes.

The developmental efforts of Clique Solar have been supported by IIT Bombay and The Ministry of New and Renewable Energy (MNRE).

About Ramakrishna Mission Students Home

Ramakrishna Mission Students Home consists of three fully free educational institutions: a Residential High School, a Residential Polytechnic College and a Primary Day School. This residential Students Home is serving poor orphan and destitute boys selected from various places, mostly rural areas, to study in Residential High School and Residential Polytechnic College. Primary Day School does not have hostel and boys and girls from the local community are admitted as day scholars.

Since it is meant only for the poor who cannot afford education, it provides free education, food and accommodation and other personal expenses to the inmates. It combines the ancient Gurukula system with modern technology under the care of monks of the Ramakrishna Order. It was started in 1905 by Swami Ramakrishnananda, a direct disciple of Bhagavan Sri Ramakrishna. Currently there are about 670 students in residence. The Home runs on the generous donations contributed by philanthropic public and institutions.

About Clique Solar

Clique Solar is in the domain of Solar Concentrated Technology and works towards addressing needs of the industrial and commercial sectors in the space of heating and cooling with its indigenous and commercially proven solar concentrating technologies.

The inquisitive and curious minds led by Dr Shireesh B Kedare and Mr Ashok Paranjape, have been working relentlessly towards making energy self-sufficiency part of reality around us. The vision and thought is reflected in our innovation – ARUN® dish. After spending over a decade in understanding and aligning needs of the companies with rigorous engineering, the team has launched a viable solar concentrator system – ARUN - a Fresnel paraboloid solar concentrator system. It has received developmental support from the Ministry of New and Renewable Energy (MNRE) and I.I.T. Bombay.

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