News for the month of December 2015

Mixed industry opinion on performance based subsidy

Concentrated solar thermal systems receive a fixed subsidy per area basis irrespective of the technology. It is observed that several in-efficient technologies end up using a larger area to deliver the same heat output as compared to another superior technology hence a larger chunk of subsidy outflow in the former. Is it time to put in a mechanism for a performance based subsidy instead of area based subsidy by measuring the kcal or kW_{th} using suitable devices?

Prof. Ajay Chandak, a developer and researcher substantiates that for 1 crore kCal of heat requirement say in a place like Ladakh, a concentrated dish requires only 9.3 m2 area. In comparison parabolic trough or linear Fresnel requires close to 14 m2 and Scheffler technology requires about 23 m2. As a result the higher area systems result in more subsidies per area and government unnecessarily loses more money by way of subsidies to get same effect.

Dr. Ramkrishna Sonde of Thermax Ltd. values this idea to tackle the sub-standard systems however states that measuring solar thermal heat is not as easy as you measure the electrons that come out of a typical solar photovoltaic cell. Merely computing the heat output will not serve the purpose. It will require several mathematical calculations to be built in to arrive at the optimal area to heat delivery ratio. For the purpose there should be a debate invited from manufacturers and scientists involved in the concentrated solar thermal development.

Deepak Gadhia one of the early promoters of Scheffler dishes in India and now a social scientist of concentrator solar thermal reveals that Scheffler Concentrator due to its inherent design of a stationary focus has co-sine losses and thus lesser efficiency than parabolic dishes. In the latter case the focus moves along with the dish thus having 100 % aperture facing sun. The stationary focus Scheffler dish is easy to install more nearer to ground without cranes and also easy to maintain and repair. These factors compensate the lesser efficiency by reduced cost and thus the cost of ownership and payback is equal if not better for the end client.

Dharmenra Gor of Taylormade Solutions contradicting the idea of performance based subsidy states “performance of the system is directly connected to DNI, location, mirrors, wind and many other small and big factors. Mirrors are deteriorating with time, so performance base is ridiculous and impossible and the customers who are any way a bit reluctant to go in for the high temperature solar thermal applications because of the longer paybacks will shy away.”

Madhusudhan Rao of Oorja Energy welcoming the suggestion mentions “this will start the trend towards delivering better value in terms of Rs./kWh_{th} rather than Rs./m2. It will also help in ensuring that manufacturers deliver systems with better annual efficiencies. However, it is needs to be seen how a mechanism can be developed for the same and in

what manner that will aid in providing subsidies to the customer. I am sure all stakeholders can arrive at a market-oriented model through dialogue."

Performance based subsidy has the potential to invite debate and deliver a suitable solution. The time is ripe establish this ante.

(Research study undertaken by Solar Thermal Federation of India)

http://www.stfi.org.in

Clique Solar exhibits and present at COP21, Paris

Clique Solar was invited as one of the two innovative Indian climate change companies to showcase its solutions at the political International Climate Change conference (COP 21), Paris.

Abhishek Bhatewara was one of the signatories to the "Entrepreneurs' Call to Climate Action and COP21", a cause which supported by over 121 CEOs in the cleantech space across 26 countries and by 26 international organizations for a 100% Renewable Energy future. It was organised by WWF International and Ministry of the Environment and Energy, Sweden. He also spoke at the event organised by International Energy Agency under the Lima-Paris Action Agenda on 'Financing innovation to take action to the next level', to discuss the financing needs to scale up R&D and explore public and private financing solutions. According to Bhatewara owing to capital-intensive nature and long gestation periods for high temperature solar thermal systems, lack of easy financing in India and the unwillingness to invest by venture capitalists in cleantech start-ups in India was of concern. Other speakers at this forum included Ségolène Royal, Minister of Ecology, Sustainable Development and Energy, of France, Dr Ahmad Belhoul, CEO of Masdar, and Jean-Pierre Clamadieu, CEO of Solvay.

Clique Solar exhibited at the World Intellectual Property Organization (WIPO), Paris. The aim of the exhibition was to help demonstrate the important role that the intellectual property system plays in providing incentives for the development and transfer of technology.

Bhatewara said "we feel that this is recognition to the huge impact that ARUN® solar concentrator technology can have on Climate Change globally. We are eternally grateful to IIT Bombay for the technological support and MNRE for the financial support they have provided us over the years."

http://www.cliqusolar.com

Higher temperature system developed by Oorja Energy

Hyderabad-based Oorja Energy Engineering (OEE) has upscaled its earlier 2 m^2 and 4 m^2 troughs and developed a 12 m^2 parabolic trough using evacuated absorber tube. The 12 m^2 trough can provide temperature up to 300 ^OC. Such higher temperatures will help the company address the requirement for thermal storage from the industries to enable users to extend the benefits of solar thermal systems to non-solar hours. The tracking system is operated using a slew drive. Presently the system is under test for thermal energy storage using thermic fluid.

The evacuated receiver tube is made of stainless steel pipe carrying the Heat Transfer Fluid (HTF) with outer borosilicate glass. Steel tube pipe and the glass tube are joined using glass-metal welding.

Synthetic oil that has better resistance against degradation to mineral oil is used to collect the heat in single tank storage. The heat storage tank is insulated with 200 mm high density mineral wool to avoid losses. T=Thermic fluid storage is at very low pressure and does not covered under IBR. Instead of using a thermocline system, OEE plans to use a movable insulated barrier that would segregate the hot and the cold fluid thus lowering the losses due to convection inside the tank.

The suppliers of the receiver in Germany successfully tested for its efficiency at German space agency DLR. The company claims that for the 12 m^2 concentrator that receives roughly 10 kW of solar radiation, losses due to the receiver account for only 200 W.

OEE tested the complete system on 21st November 2015. The total direct radiation falling on the trough was 34 kWhth and the total heat produced was 17.5 kWhth. The overall efficiency recorded was 51.5%. With higher radiation during summer time the total output is expected to be higher and the efficiency too will be better due to lower cosine losses.

OEE soon plans to get the entire trough tested at University of Pune or National Institute of Solar Energy.

http://www.oorja.in/

NEERI gets its first concentrated solar system

National Environmental Engineering Research Institute (NEERI), Nagpur a body under the Council for Scientific and Industrial Research (CSIR) has installed the first concentrated solar thermal system, which is of parabolic reflecting type. It uses 2 dishes of 22 m^2 for steam generation. The solar steam generated is for sterilization testing and hydrogen generation and is used only when sunlight is available. It called an investment of Rs. 4 lakh and will save nearly 1,500 kgs. of Liquefied Petroleum Gas (LPG).

Since the location of place of use is in remote area hence authorities at NEERI decided to go for clean energy technologies rather than burning wood. An assessment undertaken also revealed that the solar thermal steam generation system would pay back in less than 4 years thus the use of LPG will be avoided.

According to Green Life Solutions Pvt. Ltd., Nagpur manufacturers of the system, barring the reflectors, which are imported from Germany all the other components are indigenously manufactured. They have also trained the personnel at NEERI for upkeep and maintenance.

The system is successfully working since 4 months and the satisfied authorities at NEERI plan to invest more into this technology for steam cooking in their canteen for meeting heat requirements for day meals.

http://www.neeri.res.in/

Heating needs from solar fulfilled at ITC Gardenia

ITC Gardenia has commissioned a 96 m2 concentrator solar thermal system for meeting their day-to-day hot water needs as a hot water maker. Set up at a cost of Rs. 13.5 lakh it is used for meeting the hot water needs of staff rooms as well cafeteria.

Although the system was commissioned in 2009 but the actual functioning started in November 2014 when it finally received IBR approval. It is put in hybrid mode with the 60 TR heat pump capacity where the feed water containing cold water is mixed with the hot water generated from the solar thermal system.

About 300 staff personnel employed daily have hot water bath which is fulfilled by the solar thermal system whenever sunlight is active. The solar thermal is assisting in annual steam recovery of about 15000 kgs., saving close to 7,000 kWh and is anticipated to payback within 4 years.

According to authorities at ITC Gardenia, barring some engineering challenges, high temperature solar thermal systems should be encouraged and explored as they help reduce fuel usage and payback in less than 5 years. Uncertainty of energy prices gives this technology an advantage giving consistent output during select days of the year.

http://www.itchotels.in/itcgardenia

Interview of Dr. A.K. Singhal, National Project Manager, UNDP-GEF Concentrated Solar Thermal Programme (to be received yet)