SOLAR THERMAL ENERGY

Solar Thermal Energy for Low and Medium Temperature Applications

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Solar Thermal Energy for Low and Medium Temperature Applications

Global warming and climate change caused by carbon emission are now well recognized. The use of solar energy has the best potential for zero emission energy supply. The earth has a plethora of space and resources available to take advantage of the energy the sun can provide. Solar PV systems have the advantage of producing direct electricity but suffer from the lower efficiency (10-15%) and lack of proper energy storage technology. Solar thermal systems are less costly and highly efficient. Moreover, solar thermal storage techniques are well developed. In fact, among all renewable energy systems, solar thermal systems have viable potential for energy storage. A large proportion of energy needs is used as industry process heat. For example, industry consumes approximately 40% of the United States energy needs as process heat. Solar thermal heat can directly be used for this purpose and solar thermal systems can achieve about 80% efficiency in producing direct process heat. Therefore, solar thermal energy is the most viable renewable energy source capable of producing low and medium temperature process heat.

This seminar will present recent advancements in low and medium temperature solar thermal applications. Solar thermal research activities at Queensland University of Technology (QUT) will be presented and some promising research directions will be outlined.

ABOUT THE SPEAKER

Dr. Azharul Karim is currently working as a Senior Lecturer in the Mechanical Engineering Discipline, Queensland University of Technology. He received his PhD in 2007 from University of Melbourne respectively. Through his scholarly and innovative research, he has established a national and international standing. His excellence in research has been demonstrated by development of many innovative new products, 142 high quality refereed publications (including 65 Journal papers, 2 books and 12 book chapters), 16 research grants amounting A$3.2 million, being invited by reputed world universities for invited seminars, his editorial role in top Food Drying Journals and establishment of national and international research collaborations. Dr Karim is the inventor of energy and water efficient ultrasonic washing machine (patent WO02089652) and Ultrasonic dishwasher (patent WO0229148). He is the assistant editor of ‘Drying Technology’ and ‘Journal of Industrial Engineering’ journals. Dr Karim is currently leading ‘Energy & Drying’ research group at QUT. In last five years, he conferred 9 PhD degrees. His current research areas are Solar thermal energy, Nano-fluid thermal storage and Microstructure investigation of food drying.