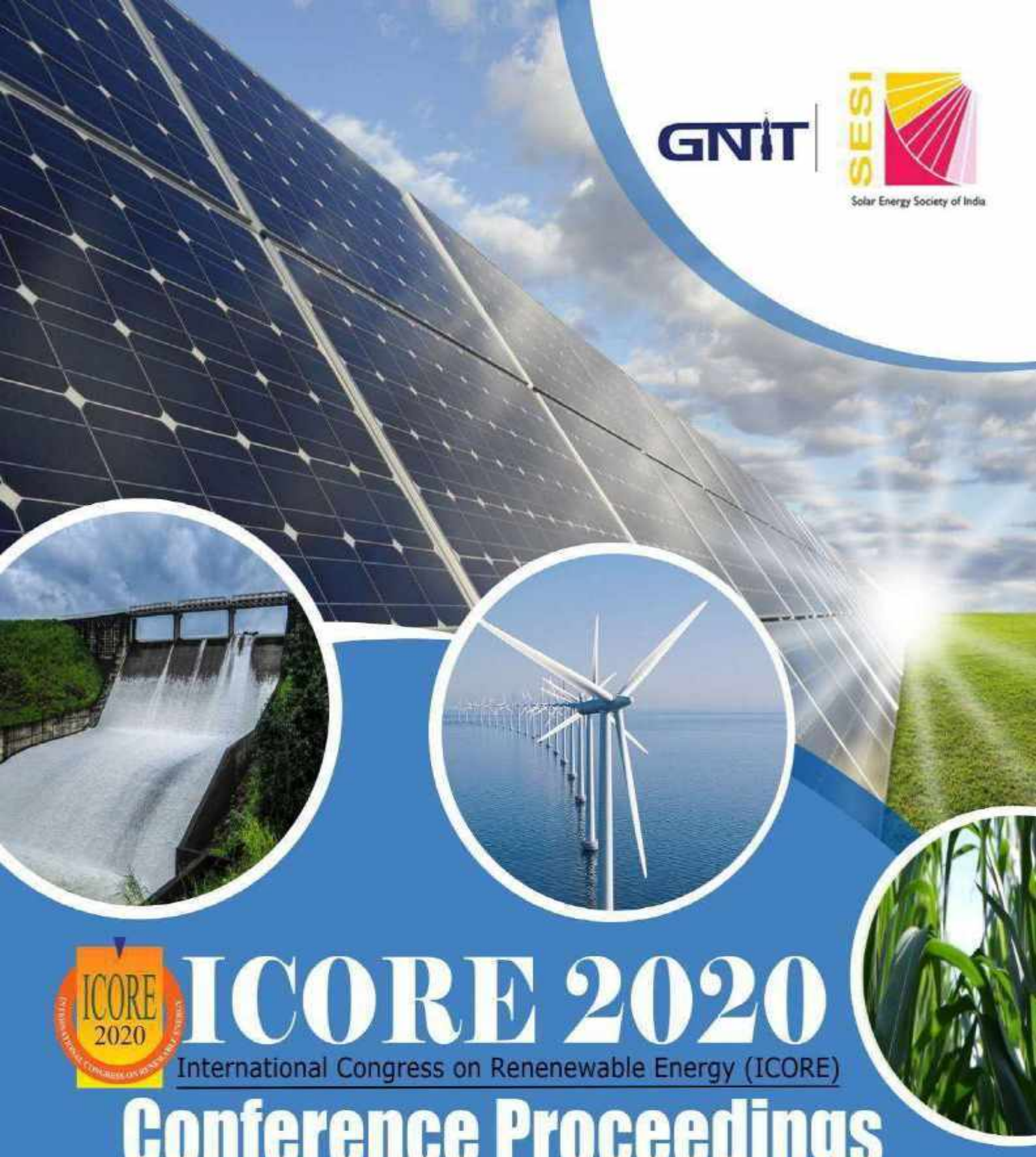

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ICORE 2020

International Congress on Renenewable Energy (ICORE)

Conference Proceedings

7th-8th February, 2019

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Sardar Taranjit Singh
Managing Director, JIS Group

MESSAGE

I feel delighted that Guru Nanak Institute of Technology in association with Solar Energy of India and other premier Institution like IET, ISOC is organizing the 15th Edition of the International Congress on Renewable Energy (ICORE 2020) at GNIT during 7-8 Feb 2020, which is happening first time in Eastern India. A good number of Research papers have been submitted by Faculty, Research Scholars & students. I believe such type of conference will help to agglomerate the research potentiality of diverse horizons into a single platform which will assist the mankind for sustainable development & growth.
I wish a very grand success of this International Congress.

Sardar Taranjit Singh
Managing Director

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Prof.(Dr.) Santanu Kumar Sen
Principal, Guru Nanak Institute of Technology, JIS Group

MESSAGE

On behalf of GNIT and ICORE 2020, I extend a very warm welcome to all the participants, facilitators and delegates. The conference aims to facilitate the students, faculty members and participants with diverse spheres of learning covering all facets of renewable energy and will focus on Solar Energy meticulously endorsing a platform for researchers, academicians, policy makers and industrialists globally. The Conference will foster amalgamation of diverse ideologies and endow with opportunities to exchange ideas and knowledge, to consolidate research networking and collaborations. Participants will be able to interact with stalwarts from the renewable energy community in India and abroad and engage in the best of renewable energy developments and practices. ICORE will provide the best input in the domain of Renewable Energy Technology and Environment Energy Management in Power Sector, Computational Techniques in Energy, Nanotechnology applications, Energy Infrastructure Security, Big Data and IoT in Energy to name a few. I wish the organizing committee the best wishes and welcome all the participants to GNIT for the two day endeavor showcasing the best practices, scope and future of Renewable Energy.

Prof(Dr) S. K. Sen)
Principal

CONTENT

New approach of a Conceptual Solar Thermal Steam Generator and its Design & Optimization

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Abstract – Concepts for solar thermal power systems are based on parabolic trough, tower or parabolic disks either heating molten salts, mineral oil, and air or generating steam. In this research work we propose, a new design approach of a solar steam generator/boiler. We have used a design tool here for optimization of system efficiency considering different subsystem efficiency. This concept comes from the conventional thermal power plants boiler, with the difference that the heat comes from mirrors that concentrate the solar radiation on its external absorbing side at open air, instead of fuel flames heating its internal tube grid. The results of our conceptual design show how much plant performance is achievable, comparable with the most advanced solar concepts. From analysis of this innovative solar boiler applied to electricity production, it is found that overall efficiency of the conversion from direct solar irradiation energy to electricity is above 20%, which is comparable to the value of parabolic trough and central tower technologies. With best of our knowledge, no one has reported this kind of work.

ICORE/2020/058

New approach of a Conceptual Solar Thermal Steam Generator and its Design & Optimization

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Abstract – Among the compound of solar panels cadmium and lead are toxic metal. So solar panels create 300 times more toxic waste per unit of energy than nuclear plants. This can be overcome by using perovskite solar cells. The name perovskite solar cell is derived from the ABX3 crystal of the absorber materials which is referred as perovskite structure. Perovskite structure consists of hybrid organic-inorganic lead or tin halide based material. The most commonly studied perovskite absorber is methyl ammonium lead trihalide (CH3 NH3 PbX3). Solar cell efficiencies of devices using these materials have increased from 3.8% in 2009 to 25.2% in 2019. Perovskite solar cells hold an advantage over traditional silicon solar cells in the simplicity of their processing and their tolerance to internal defects. Traditional silicon cells require expensive multistep process conducted at high temperature(>1000°c) under vacuums special clean room facilities. Perovskite material can be manufactured with simple wet chemistry techniques in a traditional lab environment. Main concern in perovskite solar cells is the stability. There is no standard operational stability protocol for perovskite solar cells. The degradation can be however reduced to some extend by encapsulation of perovskite absorber with a composite of carbon nanotubes. Currently Perovskite solar cells are the fastest advancing solar technology because of low cost, high efficiency, thin film potential and flexible solar modules.

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