

Preface

The conventional fossil fuels, which are about to run-out, are becoming too expensive and are causing irreparable harm to the environment. Hence, alternative sources of energy are being sought to mitigate the effect of fossil fuels on environmental pollution and global climate change. All countries are striving to explore innovative methodologies to meet their energy demands and to make significant changes in the global energy system that will have lower environmental impact. Hence, balancing the supply and demands for providing an affordable, sustainable and secure energy supply continues to play a key role in the development of countries.

However, these alternative energy sources depend mainly on the nature and require specially engineered components, infrastructure thus essentially making it a high-tech manufacturing process. Alternative energy faces the challenge of superseding the fossil fuel based supply chain which is in practice over the centuries. Thus the Engineers and Researchers should establish reliance on the transition from conventional fuel to the alternate sustainable energy sources.

Hence, this energy transition has gained considerable momentum in many of the countries including India and the energy sector is shifting from an emphasis on oil, coal and gas, towards wind, solar, water and bio-fuel technologies. This shift has the benefit of attaining energy independence and sufficiency as well as reducing carbon dioxide emissions. Implementing a sustainable and eco-friendly strategy in energy technologies and materials will help in achieving the energy transition.

As an initiative in creating awareness on these challenges, the Department of Mechanical Engineering, SSN College of Engineering, Chennai, India organized an International Conference on the theme of Sustainable Energy Resources, Materials and Technologies (ISERMAT 2015) during 8th and 9th of January 2015.

The aim of the conference was to bring together competences from the relevant disciplines for finding practical solutions for a sustainable energy future, to emphasize the issue of harnessing alternative energy resources, including renewable, to the domestic needs and to present the latest in the important fields of technology.

In his inaugural address, Dr. Tsukasa Yoshida, Professor, Research Center for Organic Electronics, Yamagata University, Japan, emphasized on charge transfer crystal concepts for solar cells. He also pointed out that printable, unlimitedly mass-producible organic photovoltaic cells are the only hope to meet the demand. In future, they have to be as cheap as wrapping paper, unlimitedly fast produced and have the ability to convert the sunlight to electricity at 20% efficiency.

Dr. R. Velraj, Director, Institute of Energy studies, Anna University, Chennai, India, the guest of honour for the conference, emphasized the theme of waste to wealth as a driver for environmental sustainability. He also hinted that in future, we may all have to shift to direct current devices due to the popularity of solar power.

Dr. Alawi Sulaiman, faculty of Plantation & Agrotechnology from Universiti Teknologi MARA, Malaysia, Dr. S. Karuppuchamy from Department of Energy Science, Alagappa University, Karaikudi, India, Dr. Dinesh Shanmugam, Senior Mechanical Engineer from THALES Australia and Dr. K. Elangovan, Head of Section-Mechanical Engineering, Ibri College of Technology, Ibri, Oman, delivered keynote lectures during the conference.

The conference provided major technical sessions in the areas of Renewable Energy, Environment and Heat Transfer, IC Engines and Alternate Fuels, Advanced Materials, Manufacturing Processes, Modeling and Simulation, Electrical Energy Systems and Devices. A total of 193 technical papers were presented by scholars, academicians and researchers from India/abroad. After peer review by experts, 181 papers have been considered for inclusion in the international journal "Applied Mechanics and Materials".

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