

Editorial



Ramesh K. Agarwal is the Co-Editor-in-Chief, Global Journal of Energy Technology Research Updates and is the William Palm Professor of Engineering at Washington University in St. Louis. From 1994 to 2001, he was the Sam Bloomfield Distinguished Professor and Executive Director of the National Institute for Aviation Research at Wichita State University in Kansas. From 1978 to 1994, he held a variety of technical and managerial positions at McDonnell Douglas Research Laboratories in St. Louis and became the Program Director and McDonnell Douglas Fellow in 1970. Dr. Agarwal

received Ph.D in Aeronautical Sciences from Stanford University in 1975, M.S. in Aeronautical Engineering from the University of Minnesota in 1969 and B.S. in Mechanical Engineering from Indian Institute of Technology, Kharagpur, India in 1968. Over a period of 35+ years, Professor Agarwal has worked in various areas of Computational Science and Engineering - Computational Fluid Dynamics (CFD), Computational Materials Science and Manufacturing, Computational Electromagnetics (CEM), and Multidisciplinary Design and Optimization. He has also worked in Nanotechnology and computational modeling of top-down Nanofabrication, in particular in the area of nanoparticles properties, synthesis, and their applications in drug delivery and their health effects. For past ten years, he is working in the area of clean and renewable energy; the topics include, wind energy, solar thermal energy, chemical looping combustion for carbon capture, geological sequestration of CO₂, and fuel cell and battery modeling. He is the author and coauthor of over 460 publications.

He has given many plenary, keynote and invited lectures at various national and international conferences worldwide. Professor Agarwal continues to serve on many academic, government, and industrial advisory committees. Dr. Agarwal is a Fellow sixteen societies including the Institute of Electrical and Electronics Engineers (IEEE), American Association for Advancement of Science (AAAS), American Institute of Aeronautics and Astronautics (AIAA), American Physical Society (APS), American Society of Mechanical Engineers (ASME), Royal Aeronautical Society, Chinese Society of Aeronautics and Astronautics (CSAA), Society of Manufacturing Engineers (SME) and American society for Engineering Education (ASEE). He has received many prestigious honors and national/international awards from various professional societies and organizations for his research contributions.

Global Journal of Energy Technology Research Updates is a refereed journal dedicated to publish the latest advancements in the field of energy. It provides an authoritative source of information on the development of scientific and engineering knowledge in planning, analysis, modeling, management and generation of energy. Our aim is to promote rapid communication and dialogue among researchers, scientists, and engineers working in this field.

The first paper of this inaugural issue is Nuclear Systems for Hydrogen Production: State of Art and Perspectives in Transport Sector by Castagnola *et al.* A technologically feasible transition towards a realistic and sustainable hydrogen economy (i.e. on large scale and without carbon dioxide emissions) could be made through the use of nuclear energy. In fact, nowadays hydrogen production methods without the employment of fossil fuel represent only a very small share of the total production; but the use of large scale of hydrogen produced by “carbon-based” sources is neither environmentally nor economically meaningful.

In this paper, besides an evaluation of the state of the art of hydrogen production methods *via* nuclear source, it proposes an energy scenario analysis (based on the hydrogen produced by the thermo-chemical Iodine-Sulfur process fed by High Temperature Gas Reactor (HTGR) included in a symbiotic nuclear fuel cycle) focused on the China region that would meet the sustainability criteria in both the energy and environmental domains for the transport sector.

In the second paper, Emin Açıkkalp highlights the Entransy Analysis of an Irreversible Diesel Cycle. The purpose of this paper is to research an irreversible Diesel cycle by using the entransy approach. Entransy may be expressed as the heat transfer potential of a subject; it has now begun to be used as a new thermodynamic assessment parameter. Optimization of heat transfer processes is very important because of their intensity. Result of optimizing the heat transfer is to use energy efficiently and decrease the CO₂ emission which is attributed to be the main reason for global warming. Because of these reasons, entransy analysis of a Diesel cycle is investigated and results are presented.

Third paper shows the Computation of Ancillary Service Requirement Assessment Indices for Load Frequency Control in a Restructured Power System using SMES Unit and SCES Unit by Chidambaram and Sridhar. To ensure a quality power supply, the power system should not only match the total power generation with total load and the associated system losses but should also emphasize better Ancillary Services. Even small disturbances to the power system can result in wide deviation in system frequency and therefore quick restoration process is of prime importance not only based on the time of restoration but also to ensure stability. This paper proposes various design procedures for computing Power System Ancillary Service Requirement Assessment Indices (PSASRAI) for a Two-Area Thermal Reheat Interconnected Power System (TATRIPS) in a restructured environment. Since simple conventional Proportional plus Integral (PI) controllers are still popular in power industry for frequency regulation as in the case of any change in the system operating conditions, new gain values can be computed easily even for multi-area power systems. This paper focuses on the computation of various PSASRAI for Two Area Thermal Reheat Interconnected Power System in restructured environment based on the settling time and peak undershoot concepts for control input deviations for each area. Energy storage is an attractive option to augment demand side management implementation; therefore storage devices like Super Capacitor Energy Storage (SCES) and Superconducting Magnetic Energy Storage (SMES) unit can be efficiently utilized to meet the peak demand. So the design of the Proportional plus Integral (PI) controller gains for the restructured power system without and with the storage units are carried out using Bacterial Foraging Optimization (BFO) algorithm. These controllers are implemented to achieve a faster restoration time in the output responses of the system when the system experiences various step load perturbations. In this paper the PSASRAI are calculated for different types of possible transactions and the necessary remedial measures to be adopted are also suggested.

The fourth and the final paper in this volume is on Analytical and Comparative Study of a Mini Solar-Powered Cogeneration Unit Based on Organic Rankine cycle for Low-Temperature Applications by Muhsen Habka and Salman Ajib. In this paper, the authors analyze the characteristics of a small Combined Heat and Power (CHP) system based primarily on Organic Rankine Cycle (ORC) and heating plant connected in series considering a low-temperature heat carrier heated entirely by a solar flat plate collector. For specific power production, comparisons of this combined layout with stand-alone ORC and with the traditional ORC-CHP have been conducted. It is shown that the high heat source temperatures and CHP ratios improve the performance of the overall series plant, while the high supply and return temperatures have negative effects. Finally, the ORC-CHP scheme proposed in this paper highlights its

suitability in wide range of applications when compared to the undesirable high-temperature condensation heat of ORC especially at low ambient and heat source temperatures.

This Journal will publish editorials, original articles, letters related to every field of Energy Technology. **Avanti Publisher** will also be showcased, since without their strong motivation and financial commitment, much of what has been accomplished would not have been possible.

For this first issue of the Journal, it is indeed a great pleasure to be able to publish original research articles and reviews by authors from Italy, Turkey, India and Germany. This new Journal will undoubtedly serve as a continuous stimulus to basic and applied research in years to come. It is an honor and privilege for me to contribute to its launch and early development.

I look forward to welcoming you to our community and sending our first issue containing reviews and research articles in the area of energy technology research.

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