

Special Issue of the International Journal of Thermodynamics Dedicated to the ECOS 2009 Conference

ECOS is an acronym for Efficiency, Cost, Optimization and Simulation and Environmental Impact of Energy Systems. The ECOS Conference series is dedicated to discussing aspects of energy engineering, with particular emphasis on the use of the Second Law of Thermodynamics to evaluate industrial processes and energy conversion systems, considering also their impact on the environment. The First ECOS Conference was held in Rome in 1987, and the conferences series has continued in different countries across Europe and also in China and Mexico.

The 22nd ECOS Conference was the first one held in a South American country. Brazil was proud to host this important event. The place, Foz do Iguaçu, was carefully selected due to its geographic location at the border of three countries: Argentina, Brazil and Paraguay. This location was also selected due to it containing one of the UNESCO *World* Natural Heritage sites, the Iguaçu Falls. A view of the falls can still be seen at the Conference Website: <http://www.eventus.com.br/ecos2009/>.

The Conference was organized by the ABCM (the Brazilian Society of Mechanical Sciences and Engineering) and by three of the most important Brazilian universities: the University of Campinas, the University of São Paulo and the Federal University of Santa Catarina. It was also sponsored by the ASME (American Society of Mechanical Engineers) and the ICAT (International Centre of Applied, Thermodynamics). BNDES, PETROBRAS and the Brazilian Research Foundations CNPq and CAPES contributed support to the event.

Regarding the central subject of ECOS 2009, “Energy and its efficient and sustainable utilization,” Brazil is a particularly unique country in that 45.3% of its primary energy is derived from renewable sources, with 13.6% from hydraulic energy, 16.4% from sugar cane, 11.6% from other biomass, and 3.5% from other renewable sources. Moreover, 86.7% of its electricity is generated from renewable sources. Some of the conference lectures and panels were organized to show and discuss these special aspects of the Brazilian Energetic Matrix.

We would like to thank the Editor-in-Chief Professor Michael R. von Spakovsky for the invitation to be the Guest Editors for these Special Issues of ECOS 2009. We also would like to thank the Associate Editors-in-Chief Prof. Derek K. Baker and Prof. Murat Köksal who put in a huge effort in the preparation of these issues. Finally, we are deeply grateful to all the people that contributed to this event: the participants, session chairs, lecturers and particularly the reviewers, who continued working for these Special Issues. We took into account their opinions to recommend 20 papers for submission to the journal from the 230 papers included in the Proceedings.

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