
Editorial

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Biographical notes: Antonio Heitor Reis graduated with a degree in Physics from the University of Lisbon and received his MSc in Mechanical Engineering from the Technical University of Lisbon (IST) and his PhD in Physics from the University of Évora, Portugal. From 1981 to 1986, he did research on energy at the National Laboratory for Engineering and Technology. He joined the University of Évora in 1986, where he teaches Physics and Engineering courses. He is currently the Director of the Evora Geophysics Centre of the University of Évora. His current research interests comprise energy issues, atmospheric physics, flows in porous media (animate and inanimate) and constructal theory.

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A growing body of evidence shows that since a few decades ago the Earth is undergoing a period of climate change. From the reduction of polar caps and glaciers to the global average temperature increase verified from satellite measurements, other signs of change are found everywhere occurring at rates faster than those which would be expected taking into account the climate evolution in the recent centuries. Therefore also the idea that the current climate forcing is mostly due to anthropogenic causes is more and more accepted.

The increasing consumption of fossil fuels, with a consequent increase in the atmospheric concentration of CO₂ and other greenhouse gases, is a growing concern globally. The intensive use of natural resources, the changes in the natural cycles of carbon, methane, nitrogen and other substances, together with deforestation and urbanization with soil sealing, are considered to be some of the biggest drivers of the current climate forcing.

The responses to this threat must be coordinated at the global level, although the actions to mitigate the effects of climate forcing should occur from the local to the global level. Such response will require a paradigm shift in many activities, namely in resource exploitation and energy use. Many mineral and other resources that underpin the

functioning of existing human societies have reached the maximum exploitation rate. The peak oil is a paradigmatic example, as are the rare earths, and it is expected that very soon the same will happen with drinking water. In this context, the use of energy must be a global target. It is necessary to increase the efficiency of energy use by reducing the losses of exergy, to facilitate the transition from fossil energies for renewable energies, to change consumption patterns and influence energy policy decisions.

The Third "Global Conference on Global Warming" was held in Lisbon, from 10 -14 July 2011, and brought together researchers, scientists, engineers, practitioners, and policy makers from all over the world to exchange information, present new technologies and developments, and discuss the future directions, strategies and priorities in a global warming scenario, namely energy use and energy efficiency, mitigation and adaptation strategies. In total, 112 papers were presented, including the state of the art keynote lectures, in normal and seven specialized sessions GCGW 2001. This special issue includes selected papers presented at the conference, which cover topics that range from the global warming scenario, greenhouse gases emissions and atmospheric pollution, to energy exploitation and use, carbon storage, energy policy, and impacts on societal and economic activities.

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