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GUEST EDITORIAL

Transformation towards sustainable bioenergy systems

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Societal progress, economic growth, and protection of the environment all constitute into a systems-based development framework for addressing current challenges. An example of such challenge is developing alternative routes for energy generation using non-conventional renewable energy sources (e.g. bio-based, forest biomass, agricultural, etc.), coupled with nutrient recovery, water conservation, emissions mitigation, and revenue generation. In addition, as described in the Brundtland Report, the sustainable development of these energy systems should "meet the needs of the present without compromising the ability of future generations to meet their own needs". Moreover, preventing and reducing emissions of pollutants, across all media, for energy production can be approached through other means, including the design, evaluation, and improvements of these processes, products, and their supply chains.

More recently, there has been a shift towards transforming and applying these pollution prevention/reduction and cost-effective solutions into bioenergy systems. Sustainable bioenergy systems will play a decisive role on the path forward to meeting the energy demands of a growing global population and their economic desires. Indeed, given contemporary climate change challenges, sustainable bioenergy systems have a role to play in mitigation, adaptation, and transformation efforts. Therefore, the search for sustainable energy will continue to influence the twenty-first-century research, business and policy needs. For example, in the manufacturing sector, these solutions can improve efficiencies as well as public perceptions by decreasing the use of materials and reducing the negative environmental impacts, ultimately increasing shareholder value over the long term.

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This special issue of *Clean Technologies and Environmental Policy* is promoted by the Mexican Network of Bioenergy.[1] This network belongs to the National Council for Science and Technology (CONACYT) of Mexico whose main aim is to promote scientific, technological, and innovative development for stimulating the sustainable use of bioenergy. The special issue is a combination of contributed articles by a diverse set of experts in the Americas and Europe, addressing a multitude of sustainability concepts such as pollution reduction and prevention, social responsibility, materials management, life cycle assessment, and industrial ecology all for the development of more sustainable and cost-effective uses of bio-based/renewable resources for energy systems. These energy systems include products (e.g. biomass, biogas, nutrients, biofuels, etc.), processes (e.g. biorefinery, gasification, bio-digesters, etc.), and supply chains of feedstocks and products. Such topics are of great interest in the local, regional, national, and international communities. This includes government, industry, academia, and decision-makers due to the multiple sustainable applications that can be carried out in bioenergy systems with the intention of achieving a substantial transition in synergistic combination with non-renewable sources, to energy based on biomass and other renewable sources.

Finally, we would like to extend our sincere appreciation to all the authors for their contributions. Also, we greatly appreciate the time and efforts taken by the reviewers to provide input and thoughts on each manuscript to improve the quality and contribution of the submission. We are thankful to the editorial team at *Clean Technologies and Environmental Policy* and to Editor-in-Chief Dr. Subhas K. Sikdar for their great support. We hope this special issue serves as a valuable source of information and concepts to assist as our society continues to implement the framework and concepts associated with arriving at the most sustainable and cost-effective uses of bio-resources, energy options, and materials management for energy production.

[1] http://rtbioenergia.org.mx.