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Advances in Hybrid Energy Harvesting: Materials, Structures and Applications

Guest Editors:

Dr. Zacharias A. Viskadourakis
Foundation for Research and Technology-Hellas (FORTH), Institute of Electronic Structure and Laser (IESL), N. Plastira 100, GR-70013 Heraklion, Greece

Dr. George Kenanakis
Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, N. Plastira 100, 70013 Heraklion, Greece

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Message from the Guest Editors

Hybrid energy harvesting can be defined as a procedure in which wasted ambient energy from various sources, such as light, heat, movement, vibration, or electromagnetic signals, is captured and converted to electric energy through transduction mechanisms such as photovoltaic, thermoelectric, pyroelectric, piezoelectric, and electromagnetic. Compared to conventional energy-harvesting devices, hybrid systems possess a significant advantage in that they can produce energy continuously, regardless of the environmental conditions. For example, a hybrid harvester consisting of a photovoltaic panel and a thermoelectric generator (TEG) can produce electric power during the day, mainly due to solar energy conversion. However, at night, TEGs continue to provide energy, taking advantage of temperature differences. Therefore, hybrid energy harvesters continuously provide stable, constant energy. As such, hybrid energy-harvesting systems could represent promising alternatives, especially for replacing batteries in low-power electronic devices and wearables, making them an important technology for achieving a sustainable society in the future.

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Editor-in-Chief

Prof. Dr. Maryam Tabrizian
1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada
2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

Message from the Editor-in-Chief

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Contact Us

Materials Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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