



20th IEEE Vehicle Power and Propulsion Conference (VPPC)

October 23-27, 2023 | Milan, Italy

Call for Paper for Special Session: “Energy Harvesting for electric Vehicular Transport applications”

Technical Program Committee

Co-Chairs

Carmine Stefano Clemente
University of Sannio, Italy
email: carmine.clemente@unisannio.it

Vincenzo Paolo Loschiavo
University of Sannio, Italy
email: loschiavo@unisannio.it

Important Dates

Digest Submission: April 17, 2023

Acceptance Notification: July 5, 2023

Final Paper Due: July 31, 2023

Conference Dates: October 23-27, 2023



The 20th IEEE Vehicle Power and Propulsion 2023 (IEEE VPPC 2023) will be held in Milan, Italy. The conference will bring together engineers, researchers, and other professionals for interactive and multidisciplinary discussions on electrified vehicle power, propulsion, and related technologies. Prospective authors are invited to submit original full papers related to the theme of the following special session.

Special Session Description:

Electric transportation is experiencing an exponential growth and development in the last years, because of the necessity of CO2 reduction to contrast the global climate change. Indeed, electric motors are more efficient with respect to common internal combustion engines. In particular, in electric vehicles electric energy is stored in batteries, and then one of the most important limitations for the spread of electric mobility is due to their autonomy and the charging infrastructure.

Energy Harvesting (EH) techniques consist in scavenging the environmental energy, otherwise wasted, and subsequent conversion in electricity to supply low-power electronics and devices. In electric automobiles such devices could be network sensors, lights, electric displays, and all on-board instrumentation. These are commonly supplied by the on-board battery with a consequent reduction in the autonomy and lifetime.

In electric vehicles there can be several sources of unexploited energy that can be recovered with EH methods. For the sake of example, vibrations on suspensions can be actively used as input for Vibration Energy Harvesters (VEHs) based on smart materials or electro-magnetic generators. Moreover, battery packs need to be cooled and Thermo-electric Generators (TEGs) could be used to recovery thermal energy.

EH techniques are based upon smart materials, which couple mechanical, thermal, radiation variables to electrical or magnetic variables (such as magnetostrictives, piezoelectrics, thermoelectrics, photovoltaics, etc.). Indeed, the research will continue to advance as long as new multifunctional technologies are developed.

With the aim to increase the recovered energy and therefore the EH device efficiency, the modelling (analytical or numerical) and the optimization still represent an open research field. Furthermore, an important aspect is represented by Energy Management systems that often are composed by an electronic interface which should adapt and control, in an intelligent way, the energy flow between source and users device.

The Special Session will be focused on the latest advances in devices, methods, modelling, optimization and energy management interfaces used in the EH applications for green transportations.

The topics of interest include, but not restricted to:

- Energy Harvesting
- Smart Materials
- Magnetostriction
- Piezoelectricity
- Thermo-electric Generators (TEG)
- Electro-active polymers (EAP)
- Shape Memory Alloys (SMA)
- Magnetic Shape Memory Alloys (MSMA)
- Meta-materials
- Radio-frequency (RF) harvesting
- Solar Energy

- Photovoltaic systems (PV)
- EH modelling and optimization
- Energy Management interfaces

Digest Submission: A digest of 3-5 pages (including figures and tables) and an abstract of 50-100 words should be written in English and must be electronically submitted in PDF format for the review process.

Manuscript Preparation and Submission: 6-page paper (without over length charge) and up to 2 additional pages are allowed (Additional page charge \$100 USD per additional page should be paid at the time of registration and final paper submission).

Submit papers at: <https://vppc2023.trackchair.com/>

For additional information and paper submission, please visit:

<https://events.vtsociety.org/vppc2023/>



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