International Conference on
Intelligent and Innovative Technologies
in Computing, Electrical and Electronics
27-28 January 2023
Venue: BNM Institute of Technology, Bengaluru, India

IEEE Technically sponsored

International Conference on

Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IC-IITCEE 2023)

Special Session on

Renewable Energies for Sustainable Electric Transportation: Challenges & Opportunities

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Objectives of the special session:

The unified integration of renewable energy sources (RES) and electric transport is attracting the energy and transportation sectors. Using Electric Vehicles (EVs) as storage to support renewable energy generation, via smart EV charging and vehicle to grid, can rise the capability of the grid to provide greater penetration of RES and EVs. In addition, charging from renewable energy would help to achieve zero or low-emission transportation. But there can be a range of impacts and benefits to the mass adoption of EVs, with the ability to aid in integrating renewable energy into current electricity grids. To attain the goal of clean transportation both the government and the private sector sectors should move from conventional houses to smart houses and from conventional vehicles to EVs. But the integration of renewable sources such as wind energy systems, varieties of bio-energies, and solar photovoltaics is challenging and most attention is needed.

Topics of interest include, but are not limited to:

- Analysis, modelling, and forecasting of electricity generation from RES and EV charging.
- Energy management and coordination of RES generation for smart charging of EVs.
- Energy storage to enhance grid stability, energy autonomy, and carbon footprint.
- Regenerative braking and its control techniques for battery energy storage.
- Market design and policies for the integration of high penetration of RES and EVs.
- Smart energy management in electric vehicles
- Design of power-sharing algorithms for converters connected to various energy sources
- Artificial intelligence for monitoring battery state of charge and state of health
- Battery management system and its charging technologies