IEEE TRANSACTIONS ON POWER ELECTRONICS

Call for Letters - Special Section on

Power Electronics Technologies for Transforming Electrical Grids

Scheduled Publication Time: July 2024

Brief description

The transformation of electrical grids assumes a pivotal role in the global effort to combat climate change. This is primarily driven by the large-scale grid integration of renewable energy resources and the electrification of transportation and industry sectors. Within this overarching trend, power electronics technology emerges as a fundamental cornerstone in shaping the trajectory of future electrical grids. Power-electronic converters find widespread applications in this transformation, including renewable power generations, high-voltage direct-current (HVDC) links, static synchronous compensators (STATCOMs), as well as energy-efficient power loads. Additionally, emerging applications like electric vehicle (EV) charging stations and power-to-x systems are further accelerating the widescale use of power electronics technologies. These advancements are collectively propelling the evolution of power-electronic-based power systems, spanning from small-scale kW nanogrids to large-scale GW energy islands, ultimately reshaping the landscape of electrical grids.

Objective

This Special Section will serve as a forum for reporting the latest developments and innovations in the Power Electronics Technologies for Transforming Electrical Grids. The outcome of this Special Section is not only to report the technological advancements, but also to raise the awareness of the importance of the research field.

Subtopics

Prospective authors are invited to submit original contributions and industry-focused papers on related topics of interest including, but are not limited to, the following:

- Grid-forming converter technologies and industry practices
- Applications of artificial intelligence and communication technologies for electronic power grid systems
- Advancements in power electronics for power-to-x (e.g., green hydrogen and power-to-heat) systems
- Emerging power electronics technologies for DC transmission systems and DC grids
- Grid-forming STATCOMs, E-STATCOMs, and other emerging flexible ac transmission systems
- Technological advancements in solid-state transformers, solid-state substations, and energy routers
- Innovations in power electronics for grid-connected energy storage systems, hybrid power plants, and high-power EV charging stations
- Hardware-in-the-Loop (HiL) simulation and testing technologies for electronic power grid systems
- Adaptation and coordination of power-electronics control and power-system protection replays
- Control interactions, stability, and power quality in grid-interactive power electronic systems

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Proposed timeline

Submission Deadline Extended to March 31, 2024

- October 1, 2023 – Open to Manuscript Submissions
- ~~January 31, 2024 – Manuscript Submissions Deadline~~
- March 15, 2024 – Final Decision Notification
- April 1, 2024 – Manuscripts Forwarded to IEEE for Publication
- April 15, 2024 – Manuscripts Published Online as Early Access
- July 1, 2024 – Special Section Published in an IEEE TPEL Issue