Call for papers

IEEE Transactions on Industry Applications

Special Issue on

Advanced Control and Energy Management of Large-scale Green Hydrogen Systems in Smart Cities and Resilient Environments (MGHS)

Hydrogen energy is becoming increasingly important in the global energy transition with its zero-carbon emissions, flexibility, and ability to convert with other energy forms such as electricity and heat. Many countries have established national strategies to advance hydrogen energy as a central element of future energy systems, accompanied by the growing integration of renewable energy sources. The large-scale deployment of hydrogen energy and the continuous improvement of hydrogen-related infrastructure have strengthened the interaction between multiple energy systems, such as electricity, hydrogen, transportation, natural gas, and heat supply systems. This offers new pathways to build zero-carbon energy supply systems for smart cities. However, the transition to hydrogen-driven smart cities presents challenges, including optimizing energy storage systems to stabilize and manage power grids influenced by renewable energy variability.

In this context, hydrogen energy storage systems (HESSs) are gaining significant attention due to their suitability for long-term storage. HESSs provide reliable power quality and stability in hybrid AC/DC grids while supporting decarbonization goals. The control and management of HESSs, at both the component and system levels, require advanced technologies that interface with different industrial ecosystems. Recent advancements in data science and artificial intelligence (AI) can further improve the efficiency and security of these systems, supporting their effective implementation.

This special issue explores technologies, strategies, and challenges in deploying HESSs within resilient, zero-carbon energy infrastructures. It invites contributions on innovative control systems for HESSs, the integration of hydrogen energy into smart cities, and the role of hydrogen in shaping future energy landscapes.

The guest editorial team cordially invites submissions of original research papers focusing on, but not limited to, the following topics:

- Dynamic modeling and grid support for electrolyzers and HESSs
- Advanced control schemes for hydrogen applications, including green steel and glass productions and hydrogen-based mobility
- Control and management of HESSs
- Monitoring, protection, and diagnostic of HESSs
- Resilience and probabilistic operation methods for integrated HESSs
- Cyber resilience and security for large-scale HESSs
- Data-driven and AI-based control for intelligent hydrogen storage and energy management
- Implementation paths and roadmaps for zero-carbon HESSs in smart cities
- Architecture and planning of integrated HESSs for smart cities

- Control strategies for hydrogen-driven smart city energy systems
- Integration of hydrogen energy with transportation, natural gas, and heat systems in smart cities

Submission Guidelines

Authors who wish to submit a paper for consideration must submit an extended abstract (two pages, free format, PDF version) to muhammad.babdelghany@ku.ac.ae and rzhouyang1108@163.com. Authors of accepted abstracts will receive a formal invitation with detailed instructions for submission of the complete manuscript to the **IAS Scholar One Manuscripts** (S1M) site. For general information about electronic submission through S1M, please refer to http://www.ias.org. Manuscripts submitted for this Special Issue will undergo a separate review process and be handled by a Guest Editorial Board.

Important Dates

- January 2, 2025: Call for papers announcement.
- March 1, 2025: Deadline for extended abstract submission.
- April 15, 2025: Decision notification for inviting full paper submissions.
- July 15, 2025: Deadline for full paper submission for review in S1M.
- February 1, 2026: Notification of final decisions.
- March 15, 2026: Due date for submission of final files.
- May 15, 2026: Due date for submission of Guest Editorial.
- September/October 2026: Publication date.

Guest Editorial Board

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