IEEE Internet of Things Journal Special Issue on
Energy Internet: A Cyber-Physical-Social Perspective

It is of significant importance to realize the decarbonization of energy systems for carbon-neutrality. The Energy Internet (EI), i.e., Internet of Things in Energy, connects energy sources and consumers (or prosumers, more generally) of various energy types (power, gas, heat, cooling, etc.) through flexible energy conversion technologies and senses their status and behaviors using advanced information and communication technologies (ICT). The development of EI has promoted the penetration of distributed energy resources (DERs) and the coordination of multi-energy systems. Besides, a considerable number of sensors (e.g., smart meters) can generate data streams on states of users and networks. However, there are key challenges that should be resolved to further improve the energy efficiency of EI, to effectively involve a massive number of end-users to develop a low-carbon energy ecosystem. In particular, the behaviors of end-users need to be analyzed from a cyber-physical-social perspective, as each user is driven by a unique set of social or economic motivations. This calls for research on data analytics and decision model development for users, the energy system, and other stakeholders at different energy-related procedures, e.g., investment, trading, and operation. Standard cyber-physical-social modeling of the energy system or end-users should be established that takes stakeholder interaction and privacy-preserving into account. On the basis of such modeling, decomposition and forecasting of user behaviors can be performed. Additionally, appropriate interaction mechanisms, including energy market mechanisms, renewable and carbon policies, aggregation and revenue allocation of DERs, and demand response programs, should be designed.

This special issue aims to cover technical issues on data analytics, energy consumer modeling, and mechanism design in Energy Internet from a cyber-physical-social perspective. The guest editorial team solicits original research papers that target at, but are not restricted to, the following scopes:

- Aggregation and revenue allocation of consumers and prosumers in Energy Internet
- Cyber-physical-social modeling of energy systems and cyber systems in Energy Internet
- Cyber-physical-social decision models for stakeholders in Energy Internet
- Data analytics and machine learning for stakeholders in Energy Internet
- Data privacy and pricing methods for Energy Internet
- Demand response programs designed for consumers and prosumers
- Cyber-physical security assessment for Energy Internet
- Application of advanced ICT solution (e.g., 5G) for Energy Internet

Important Dates:

Paper submission deadline: January 1, 2024
First Reviews Due: February 15, 2024
Revision Due: March 15, 2024
Second Reviews/Notification: May 1, 2024
Final Manuscript Due: May 15, 2024
Publication: 2024

Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, http://mc.manuscriptcentral.com/iot. When the authors reach the “Article Type” step in the submission process, they should select “SI: Energy Internet: A Cyber-Physical-Social Perspective”. Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at http://ieee-iotj.org/guidelines-for-authors/.

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