

Editorial for *Clean Energy Science and Technology* (Volume 2, Issue 2)

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All human activities are nothing more than the conversion and flow of energy, and energy flow processes that have irreversible effects on the Earth's environment are of particular concern. Energy flow processes of interest are less often purely physical, and more often include complex chemical processes involving light, electricity, heat, and force, which are inevitably distributed in almost all human activities. Therefore, the optimization of these processes towards maximizing energy efficiency is inevitably the result of multi-physical and interdisciplinary collaborations, which will ultimately have a significant impact on the likelihood and schedule of achieving the goal of energy conservation and emission reduction. The authors of the articles in this issue, with creative thinking, rigorous arguments, and abundant data, have superbly illustrated the need for multiphysics and interdisciplinary synergy in clean energy science and technology from a wide range of perspectives.

Pan et al. [1] proposed a new polymeric field synergy principle to guide the solution of low mixing efficiency and energy utilization efficiency of traditional extrusion equipment to address the key challenges constraining the development of the polymer extrusion industry with respect to the process efficiency and energy consumption of polymer extrusion equipment. Wang et al. [2] carried out a strategic research study on the better screening of work materials from the perspective of thermodynamic physical properties of work materials and proposed a quantitative judgment of the dry and wet properties of work materials based on the ideal gas heat capacity determination factor. Lu et al. [3] prepared water-insoluble blends by hydrothermal reaction using polydopamine and phosphotungstic acid; this provides a facile and promising fabrication method of proton-exchange-membrane fuel cells that is potentially applicable for operation at high temperatures and low relative humidities for the preparation of water-insoluble solid plasmonic conductors for high-performance composite plasmonic exchange membranes. Yang et al. [4] investigated and prepared a series of amorphous CuO@C-SiO₂-X catalysts by combining electrostatic assembly and the hydrothermal method, which can be applied to the carbon monoxide electroreduction (COER) reaction process. Marouani [5] explored the roles of a series of renewable energy technologies in various fields to cope with global warming and investigated the trends and successes in supporting renewable energy policies. The available options for mitigating the effects of climate change and realizing a clean energy future were explored. Zhang and Zhou [6] focused their review on important research advances in ultrafast adsorption of kinetic molecular sieves for propane and propylene separation. Li et al. [7] reviewed the main elements and ideas in Dai et al.'s article "Country-specific net-zero strategies for the pulp and paper industry" [8], discussed the rigor and applicability of its methodology, and

further considered the impacts of economic trade-offs, resource endowments, and technological advances on the net-zero emission strategies of the pulp and paper industry in various countries.

The articles presented in this issue are more or less related to interdisciplinary research ideas, such as the work of Pan et al. [1], through their theoretical study of the interrelationships between the velocity field, the velocity gradient field and temperature gradient field of a melt during the polymer extrusion process, and the polymer field synergy principle, which is a research paradigm with typical multi-physical-field characteristics and methodologically is more in line with the completeness requirements of scientific research. Extensive and profound interdisciplinary research will surely lead to an important trend of R&D in the field of clean energy and cultivate more abundant and efficient energy-saving and emission-reduction processes, methods, and products, as well as make important contributions to the protection of the Earth's natural environment on which all human beings depend. We look forward to more research teams joining this important direction to serve all mankind, and we thank all the authors for choosing *Clean Energy Science and Technology* to share their excellent research results.

Conflict of interest: The author declares no conflict of interest.

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