

Sensors and Materials

Call for Papers

Special Issue: “Smart Sensing Approaches for Low Carbon, Energy-efficient Manufacturing Processes”

Low-carbon energy saving has become one of the most important economic policies in countries all over the world. Coupled with the global trend towards sustainable development and awareness of changes in the living environment, the United Nations is committed to promoting "2050 Net Zero Emissions" and hopes to achieve it to solve the current crisis of climate change. To achieve the "carbon-free goal", each country has started to formulate energy and carbon reduction policies. For this reason, this issue focuses on low-carbon energy-saving manufacturing process technology, especially for actively developing forward-looking technologies in the precision machinery, aerospace, and semiconductor industries. The demand for energy is increasing, so how to develop related energy-saving technologies in the manufacturing process has become the main point of enterprises.

Energy consumption is fairly distributed among transportation, industries, and other sectors. The transportation sector consumes 30% of the total international energy, while manufacturing industries are accountable for one-third of the global energy consumption. It is important to note that this energy is mostly supplied by fossil fuels, which generate carbon dioxide, contributing to 36% of net global carbon emissions produced by the manufacturing industries. The demand for products is increasing due to population growth, leading to a nearly doubled need for energy in the past 30 years.

Low-carbon technologies primarily encompass carbon reduction and decarbonization technologies. Through the regulation of carbon emissions, low-carbon technologies employing sensing schemes work to decrease the concentration of greenhouse gases in the atmosphere to a relatively stable level. This contributes to mitigating or eradicating the impact of global climate change, preserving ecosystem equilibrium, achieving harmonious coexistence with the natural environment, and fostering economic development.

Numerous researchers have dedicated significant efforts to developing low-carbon emission methodologies, and their research findings have profoundly influenced the establishment of the goal of achieving carbon neutrality by 2050. Motivated by this impetus, innovative low-carbon and energy-saving sensing manufacturing processes, such as smart production systems, intelligent sensing control, smart materials application, and decarbonization analysis, are being proposed not only in engineering but also as new paradigms in smart science. This special issue encompasses the mathematical and physical

theories of smart system analysis and optimization in physics and engineering, along with their diverse applications. Prospective authors are invited to submit original papers to this special issue.

Indicative Topics/Areas

The topics of interest include, but are not limited to

- Smart Sensing Methods for Low Carbon Emission and Energy-saving Systems
- Intelligent Sensor Networks of IoT for Carbon Emission and Energy
- Sensor Designs for Detecting the Carbon Footprint
- Smart Sensing Control Systems
- Sustainable Materials Development
- Inventions/Innovative Methods for Reduction of Energy Consumption and Carbon Emission
- Optimization Schemes
- Other Low Carbon/Energy-saving Systems, Sensing Methods, and Applications

Prospective contributors are invited to submit their paper to Prof. Wang by email (wcc@mail.nsysu.edu.tw).

Schedule

Submission Deadline	August 31, 2023
Acceptance Notice	September 30, 2023
Final Manuscript	October 31, 2023
Publication Date (Planned)	November 30, 2023

Lead Guest Editor:

Prof. Cheng-Chi Wang (Ph.D.), Department of Mechanical and Electro-Mechanical Engineering (professor), National Sun Yat-sen University, No.70 Lien-hai Road, Kaohsiung, Taiwan. Email: wcc@mail.nsysu.edu.tw, wccpipn@gmail.com

(Attention)

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Editorial Department of *Sensors and Materials*

MYU K.K.

1-23-3-303 Sendagi, Bunkyo-ku, Tokyo 113-0022, Japan

Tel: +81-3-3827-8549, Fax: +81-3-3827-8547

E-mail: myukk@myu-inc.jp

