

SPECIAL ISSUE ON SMART SENSING APPROACHES FOR LOW CARBON, ENERGY-EFFICIENT MANUFACTURING PROCESSES

PREFACE



Low-carbon energy savings have emerged as a critical economic policy across nations worldwide. In alignment with the global shift towards sustainable development and heightened awareness of environmental changes, the United Nations has committed to the initiative of "2050 Net Zero Emissions," aiming to address the pressing challenges posed by climate change. In pursuit of this "carbon-free goal," countries are actively formulating energy and carbon reduction policies. This special issue, therefore, focuses on low-carbon energy-saving manufacturing process technologies, particularly within the precision machinery, aerospace, and semiconductor sectors, which are at the forefront of developing innovative technologies. Given the escalating energy demand, the advancement of energy-saving technologies in manufacturing processes has become a pivotal focus for enterprises.

Low-carbon technologies primarily encompass carbon reduction and decarbonization strategies. To regulate carbon emissions, these technologies employ sensing mechanisms to reduce greenhouse gas concentrations in the atmosphere to stable levels. Such efforts are instrumental in mitigating or eradicating the impacts of global climate change, preserving ecological balance, achieving harmonious coexistence with the natural environment, and promoting sustainable economic development.

In this special issue, eleven scholarly papers that explore smart sensing approaches for low-carbon, energy-efficient manufacturing processes are presented. Topics include applications for monitoring carbon emissions and comprehensive decarbonization analyses.

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