

SPECIAL ISSUE ON INTELLIGENT SENSING METHODS AND SMART MATERIALS FOR LOW CARBON EMISSION AND ENERGY-SAVING TECHNIQUES PART 1

PREFACE



Energy consumption is evenly distributed among the transportation, industrial, and other sectors, with the transportation sector consuming 30% of global energy consumption and the industrial sector accounting for one-third of global energy consumption. This energy is mostly supplied by fossil fuels, which generate carbon dioxide and resulting in 36% of net global carbon emissions produced by manufacturing industries. Moreover, energy consumption is increasing with time; the need for products owing to the increasing population has led to the demand for energy approximately doubling in the past 30 years.

Low-carbon (energy-saving) technologies mainly include carbon reduction technologies, carbon-free technologies, and decarbonization technologies. By controlling carbon emissions, low-carbon technologies with sensing schemes have the potential to reduce the concentration of greenhouse gases in the atmosphere to a relatively stable level, thus slowing or eliminating global climate change, maintaining the balance of the ecosystem, maintaining development that is sustainable with the natural environment, and promoting economic development.

Green smart manufacturing technologies can be applied for carbon reduction, energy saving, and decarbonization through the use of composite materials, sensing control, and optimization. Many researchers involved in the design and study of intelligent control systems have developed innovative green methodologies, which are expected to have a major impact on achieving the goal of carbon neutrality by 2050.

This special issue presents eight papers on topics focusing on green smart manufacturing technologies and relative know-how including intelligent sensing control, applications monitoring carbon emission, and decarbonization analysis.

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