

SPECIAL ISSUE ON GREEN SMART MANUFACTURING PROCESS AND ANALYSIS: PART 1

PREFACE



In 2015, the United Nations Climate Summit (COP 21) completed the Paris Climate Agreement, in which most countries agreed to achieve carbon neutrality by 2050. The most important point about the Agreement is that signatory countries have pushed forward domestic legislation to ensure that net zero, a common goal of humanity, can be achieved. Therefore, most countries have planned to achieve net zero or carbon neutrality by 2050.

Low-carbon (carbon neutral) technologies mainly include carbon reduction technologies (energy-saving technologies in areas with high energy consumption and high emissions), carbon-free technologies (clean energy technologies such as solar energy, wind energy, and biomass energy), and decarbonization technologies (carbon dioxide capture, storage, and utilization technologies). By controlling carbon emissions, low-carbon technologies reduce the concentration of greenhouse gases in the atmosphere to a relatively stable level, which is conducive to slowing or eliminating the impact of global climate change, maintaining the balance of the ecosystem, and promoting economic development.

Green smart manufacturing technologies can be applied for carbon reduction, energy-saving, and decarbonization by using smart composite materials, sensing control, and optimization. Many researchers in smart system control design and study have developed green innovative methodologies including those for engineering, physical, and biological applications, and these research results are expected to have a major impact on achieving the goal of carbon neutrality by 2050. This special issue presents six papers on topics focusing on green smart manufacturing technologies including a smart production system, intelligent sensing control, smart materials application, and decarbonization analysis. Finally, I sincerely thank Ms. Misako Sakano and Ms. Naoko Makino, Editorial Department of MYU K.K., for their kind support in the publication of this issue.

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