

Decarbonization for the energy transition and green production

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Abstract

A considerable part of the fossil CO₂ emissions comes from the energy sector, in which the main parts are released through energy-intensive industries, namely metal production, chemicals, and manufacturing. Hence, decarbonization of industries is considerably important beside the other sectors such as net zero buildings and transformation. The main concept of this speech will cover renewable energy/resources solutions after looking into potential classic decarbonization. First objective is about the upgrading of the existing processes, equipment, and plants besides implementing the heat recovery/integration based on the innovations toward reducing the energy requirements and efficiency increments. Then, the renewable resources are going to be introduced. Moreover, energy production and conversion methods, feedstocks, carbon capture and storage, and electrification will be discussed.

Overall, both classic and innovative renewable attempts are required to reach the deep decarbonization targets. At the end, the objectives are going to be expanded toward chemical industries by introducing the potential technology implementation at different subsectors. For this purpose, the assessed roadmaps and pathways will be discussed further. The primary research results of my current study reveal that although all of the inventive suggestions are not available at an industrial scale or are not economically viable yet, they will play a crucial role in the energy transition at upcoming decades.

Keywords: Industrial decarbonization, energy intensive sector, Renewable energy and resources, CO₂ mitigation

Short biography

Experienced senior researcher in the field of industrial decarbonization with broad experience in fulfilling and managing research and development projects. Specialist in the field of renewable energies with a demonstrated history of working more than 10 years, on process design, decarbonization research and energy conversion. Skilled in Aspen Plus, Power Plants, Process simulation and design, Heat Exchangers, petrochemicals processes, Python, and scientific publications. Ambitious research professional with a Doctor of Philosophy (PhD) focused in Mechanical Engineering for systems of energy from University of Brescia. Background in Chemical engineering and process design. Able to work effectively with scientists and engineers of multiple disciplines.

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