Special Issue

Advancements in CO_2 Capture Systems and Application Cases

Message from the Guest Editors

CO2 capture is a key enabler for meeting climate targets across power, industrial, and transport sectors. Effective deployment requires capture units to be engineered as part of cohesive systems. At the same time, decision-makers require transparent evidence on performance, cost, and environmental impacts. This Special Issue encourages work from both industry and academia addressing the implementation of integrated CO2 capture across sectors. The scope includes, but is not limited to:

- Comparative evaluations of capture routes across relevant applications;
- Process integration and control, covering gas purification, heat recovery, and compression–purification trains;
- Modeling and optimization, from materials and reactors to plant-level design, digital twins, and network planning;
- Durability, emissions, safety, and operability under realistic impurities and dynamic loads;
- TEA and LCA with harmonized system boundaries, functional units, and CO2 avoidance costs, including uncertainty analysis;
- Infrastructure and logistics for CO2 handling, product specifications, and storage readiness.

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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