



Carbon Capture and Utilization in Senegalese Fossil Fuel Plants: A Scoping Survey

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Abstract

Carbon capture and utilization (CCU) technologies are critical for mitigating greenhouse gas emissions from fossil fuel plants. In Senegal, where coal is a significant energy source, there is potential to enhance these technologies to reduce carbon footprint. A structured questionnaire was designed and distributed among key stakeholders, including plant managers and industry experts. The survey covered operational parameters, technological capabilities, and environmental impact assessment methods. The findings indicate that while some CCU technologies are employed, they predominantly focus on carbon capture rather than utilization or storage, with a notable proportion of plants lacking comprehensive monitoring systems for carbon dioxide emissions. Current practices in Senegalese fossil fuel plants do not fully leverage available CCU technologies. Enhancing monitoring and adoption of multiple CCU strategies could significantly reduce the environmental impact of coal combustion in the region. Senegalese policymakers should prioritise investment in advanced CCU systems, including carbon utilization pathways such as biochar production from captured CO₂ emissions, to achieve sustainable energy development goals. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Carbon Sequestration, Geospatial Analysis, CCS Technology, Renewable Integration, Energy Policy Framework*

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