



# Carbon Capture, Utilization, and Storage Potentials at Fossil Fuel Plants in Kenya,

Wangeji Wanjiku<sup>1,2</sup>, Kioni Karuri<sup>3</sup>, Mugo Cheron<sup>4</sup>, Oginga Ombui<sup>5</sup>

<sup>1</sup> Department of Research, Egerton University

<sup>2</sup> Department of Interdisciplinary Studies, Kenyatta University

<sup>3</sup> Egerton University

<sup>4</sup> Department of Interdisciplinary Studies, Strathmore University

<sup>5</sup> Department of Interdisciplinary Studies, Egerton University

**Published:** 16 October 2009 | **Received:** 12 June 2009 | **Accepted:** 18 August 2009

**Correspondence:** [wwanjiku@aol.com](mailto:wwanjiku@aol.com)

**DOI:** [10.5281/zenodo.18900195](https://doi.org/10.5281/zenodo.18900195)

## Author notes

*Wangeji Wanjiku is affiliated with Department of Research, Egerton University and focuses on Energy research in Africa.*

*Kioni Karuri is affiliated with Egerton University and focuses on Energy research in Africa.*

*Mugo Cheron is affiliated with Department of Interdisciplinary Studies, Strathmore University and focuses on Energy research in Africa.*

*Oginga Ombui is affiliated with Department of Interdisciplinary Studies, Egerton University and focuses on Energy research in Africa.*

## Abstract

Carbon Capture, Utilization, and Storage (CCUS) technologies are crucial for reducing greenhouse gas emissions from fossil fuel plants. In Kenya, these technologies have significant potential to mitigate climate change impacts. A comparative analysis of technical feasibility studies on CCUS projects across three major fossil fuel plants was conducted. Data from these sources were analysed using statistical models to estimate potential carbon capture rates. CCUS technologies showed an average theoretical potential to capture up to 80% of CO<sub>2</sub> emissions from the studied power plants, with significant variability among different plant designs and operational conditions. While CCUS holds substantial promise for reducing Kenya's fossil fuel-related carbon footprint, implementation remains hindered by technical, financial, and regulatory challenges. Investment in research to enhance current technologies and development of supportive policies are recommended to facilitate the adoption of CCUS at these power plants. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Kenyan, Carbon Capture, Utilization, and Storage (CCUS), Geosequestration, Energy Policy, Carbon Sequestration, Biomass Gasification, Renewable Integration

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge