
# Clean Coal Technologies in Nigeria: Prospects and Challenges

Coal has historically played a minor role in Nigeria's energy mix, with no significant coal-fired power plants currently operational. However, the potential for clean coal technologies (CCTs) to contribute to Nigeria's energy needs while addressing environmental concerns is worth exploring. The Friends of Sustainability and Ecology Association (FOSEA) recognizes the need for cleaner energy alternatives, even as Nigeria prioritizes renewable energy under its Energy Transition Plan (ETP). This essay examines the prospects and challenges of adopting CCTs in Nigeria to balance energy security and environmental protection.

Clean coal technologies, such as carbon capture and storage (CCS) and high-efficiency low-emission (HELE) systems, aim to reduce the environmental impact of coal use. CCS captures carbon dioxide ($CO_2$) emissions from power plants and stores them underground, potentially reducing emissions by up to 90%. HELE technologies improve the efficiency of coal combustion, reducing fuel consumption and emissions. While Nigeria has no active coal plants, a proposed 600 MW coal-fired plant has been stalled due to land-use conflicts, highlighting the need for cleaner alternatives if coal is to be considered.

Nigeria's energy sector is dominated by fossil gas (80% of electricity generation) and hydropower, with negligible contributions from other sources. The absence of coal in the current energy mix presents an opportunity to integrate CCTs without entrenched infrastructure challenges. FOSEA advocates for feasibility studies to assess the viability of CCS in Nigeria, drawing on global examples like Sweden, where carbon taxes have reduced emissions by 25% since 1995. Such fiscal policies could incentivize cleaner coal use if Nigeria pursues this path.

The environmental risks of coal, including air pollution and high $CO_2$ emissions, are significant barriers to its adoption. Coal combustion contributes to particulate matter, which poses health risks to communities. FOSEA emphasizes the need for stringent regulations to ensure that any coal projects adhere to global best practices. The organization's advocacy for sustainable energy aligns with Nigeria's commitment to net-zero emissions by 2060, which prioritizes renewables but allows for transitional technologies like CCTs.

Economic considerations are critical in evaluating CCTs. The high cost of CCS, ranging from $100 to $1,200 per ton of CO2, poses a financial challenge for Nigeria, where funding for environmental projects is limited. FOSEA's engagement with international partners, as highlighted at the Nigeria Climate Change Forum (NCCF) 2025, seeks to attract investment in clean energy technologies. Green bonds and carbon credits could provide the necessary funding to make CCTs viable.

The social implications of coal projects, particularly in mining communities, cannot be ignored. Coal mining can lead to land degradation and displacement, as seen in other mineral-rich regions of Nigeria. FOSEA's initiatives, such as green grooves and sustainable land management, aim to mitigate these impacts by promoting reforestation and community participation. By integrating CCTs with environmental restoration, FOSEA ensures that coal projects, if pursued, align with sustainability goals.

Policy coherence is essential for the success of CCTs. Nigeria's Climate Change Act (CCA) 2021 mandates emissions reduction, but the lack of specific policies for coal technologies creates uncertainty. FOSEA advocates for a clear regulatory framework that balances energy needs with environmental protection. By engaging with Nigerian senators and governors, FOSEA promotes policies that prioritize low-carbon technologies, including potential CCT applications.

Public perception of coal is another challenge, given its association with pollution. FOSEA's education campaigns, accessible via FOSEA.COM.NG, aim to inform communities about the potential of CCTs to reduce emissions. By highlighting successful global examples, such as Australia's CCS projects, FOSEA seeks to build public support for cleaner coal technologies as a transitional energy source.

The integration of CCTs with Nigeria's broader energy strategy requires careful planning. The Renewable Energy Master Plan (REMP) prioritizes solar and hydropower, but transitional fuels like natural gas and potentially clean coal could bridge the gap to a renewable future. FOSEA's collaboration with stakeholders ensures that any coal-related initiatives are part of a holistic energy transition strategy that minimizes environmental harm.

In conclusion, while clean coal technologies offer a potential solution to Nigeria's energy

challenges, their adoption must be approached cautiously. FOSEA's advocacy for sustainable practices, community engagement, and policy reform positions it as a key player in shaping Nigeria's energy future. By promoting research, investment, and public awareness, FOSEA ensures that any exploration of CCTs aligns with environmental protection and climate goals. Continued dialogue with policymakers and international partners will be crucial to realizing this potential.

References

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