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Incorporating Small Modular Reactors with Solar and Wind for Ghana's Sustainable Energy Transition Beyond Conventional Nuclear Power Ambition Post-COP28

Purpose: The paper explores integrating Small Modular Reactors (SMRs) with solar and wind energy as an alternative to conventional/traditional nuclear power plants/reactors for Ghana's sustainable energy transition post-COP28.
Methods: The study employed a quantitative analysis to evaluate the effects of combining SMRs with solar and wind energy in Ghana's energy landscape using HOMER and the IAEA MESSAGE tool.
Findings: The paper offers increased adaptability and expandability in fulfilling the nation's energy requirements. Thus, Ghana has a good chance to attain a sustainable energy mix by integrating SMRs with wind and solar power. Furthermore, this strategy lowers greenhouse gas emissions and the reliance on fossil fuels while improving energy security, grid stability, and resilience.
Research Limitation/Implications: This study concentrates on the technical planning and elements of combining solar and wind energy with SMRs in Ghana. Hence, emphasis on the need for additional research on public acceptance, regulatory frameworks, and socio-political factors that affect adoption.
Practical Implication: To speed up Ghana's energy transition after COP28, the study's findings highlight the significance of investing in integrated energy infrastructure that combines SMRs with solar and wind energy. Such an infrastructure has the potential to improve energy security, promote sustainable development, and mitigate climate change.

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Confirm that the work is original and has not been published anywhere else

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Track Classification: Topical Group D: Considerations to Facilitate Deployment of SMRs: Track 13: SMRs in Energy Planning for Climate Change Mitigation