



Resilience of the Eastern African electricity sector to climate driven changes in hydropower generation

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Notwithstanding current heavy dependence on gas-fired electricity generation in the Eastern African Power Pool (EAPP), hydropower is expected to play an essential role in improving electricity access in the region. Expansion planning of electricity infrastructure is critical to support investment and maintaining balanced consumer electricity prices. Variations in water availability due to a changing climate could leave hydro infrastructure stranded or result in underutilization of available resources. In this study, we develop a framework consisting of long-term models for electricity supply and water systems management, to assess the vulnerability of potential expansion plans to the effects of climate change. We find that the most resilient EAPP rollout strategy corresponds to a plan optimised for a slightly wetter climate compared to historical trends. This study demonstrates that failing to climate-proof infrastructure investments can result in significant electricity price fluctuations in selected countries (Uganda & Tanzania) while others, such as Egypt, are less vulnerable.