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Powering Africa - Projected costs and emissions

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Energy is a fundamental driver of economic growth. Several Sub-Saharan African countries are amongst the least developing economies in the world. A large proportion of the population in the region also lacks access to electricity and other modern energy services, while the individuals who have access are faced with frequent outages. This paper presents scenarios in which universal electricity access across the African continent is achieved by 2030 at a range of electricity consumption levels. A cost-optimization model is used to identify the least-cost generation mix in each country individually so as to meet the projected demand. Several generation options are allowed in each nation, while cross-border electricity trade is enabled at existing and future planned levels, so as to allow exploitation of untapped energy resources in remote regions of the continent. The results indicate that with a higher electricity consumption, CO_2 emissions in generation increase considerably. This is due to coal rising as one of the dominant fuels in the supply of centralized electricity, and is of particular importance in climate change negotiations.