

4 east African countries are going for nuclear power—why this is a bad idea

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The east Africa region has the fastest growing population in Africa. Between 2013 and 2017, its growth rate was [twice the African average](#). The region is also experiencing strong [economic growth](#). It's sub-Saharan

share of GDP has [risen](#) from 14% in 2000 to 21% in 2022.

Such growth translates to higher electricity demand. Among a variety of new energy proposals is building [nuclear power plants](#). Earlier this year, Uganda announced plans to construct a [2,000MW nuclear plant](#) 150km north of Kampala, with the first 1,000MW operational by 2031. [Rwanda](#) also recently signed up to a deal to build a [nuclear reactor](#), while [Kenya](#) and [Tanzania](#) have made more or less similar announcements.

It is in many ways tempting for these countries to pursue a [nuclear power plant build](#). Even a single large-scale [nuclear reactor](#) would typically double national electricity generation capacity. In addition, it is a technology that is—in theory at least—able to provide a constant electricity output independent of weather, season, or time of day.

Another factor that motivates many potential entrants to nuclear power is that it has historically been perceived in many quarters as [confirmation of high technological status](#) and proof of national respectability. This is despite many of the world's technologically and economically strongest nations now having shut down their nuclear plants. [Germany](#) and [Italy](#) are examples.

But there are several risks of choosing the nuclear path. The biggest in my view is financial. The costs of constructing, maintaining and later decommissioning a nuclear plant make this one of the [most expensive forms of electricity generation](#). The actual cost is invariably a lot [higher than originally announced](#).

Along with that, the construction period is usually [many years longer](#) than declared at the start.

In addition, [safety issues](#) can never be discounted when dealing with [nuclear energy](#), as the [2011 Fukushima disaster](#) in Japan amply

illustrated.

The perilous path to nuclear

There are two arguments against new nuclear as currently considered by east African countries.

The first is financial. The construction cost of a new nuclear plant typically stands at about US\$5 billion per 1,000MW. The cost of a 2,000MW build in Uganda would be of the order of that country's [annual total tax revenue](#). As such, the project would rely on massive loans, which also come with considerable interest.

The second is the risk of complete political and economic dependence on the nuclear build sponsor country. France, South Korea and China are building a small number of [nuclear plants](#) outside their borders. China is now part of the [Ugandan nuclear project](#).

But the country that has been by far most aggressive in promoting itself as an international [nuclear plant](#) developer is [Russia](#). In 2019 it had already secured nuclear cooperation agreements with [18 African countries](#), with several more concluded [more recently](#).

To circumvent the prohibitive costs, Russian nuclear developers have offered to provide comparatively low interest [financing](#) where repayments only kick in several years after the start of construction, and continue for several decades thereafter. The drawback is that the country develops a [strong long-term dependence on Russia](#) to meet one of its most basic needs: electricity provision.

The situation has been made more risky by the uncertainty of Russia's full-scale war in Ukraine. The fallout from this war may well ruin and lead to the complete overhaul of the Russian state. This would result in

the disruption and ultimate termination of projects already in progress, with the concurrent loss of all funding and resources invested up to that point.

East Africa's likely future energy mix

In view of the financial risk and high cost, and as global experience has shown that it typically requires [ten or more years to set up a new nuclear plant](#) from project approval to electricity production, east African countries should pursue alternatives for electricity production.

New medium-scale solar, wind and geothermal power-generating facilities would likely dominate the expansion of east African electricity generation capacity in the coming decade as they are cheap in comparison. Typical construction timescales are also much lower than nuclear or hydro megaprojects.

Take hydropower generation, which uses the natural flow of moving water to produce electricity. This source of power has been the most significant in east Africa for decades. Building more dams is both time-consuming and, at times, controversial. Nevertheless, major projects using this technology are currently still being built. An example is the [2,115MW Julius Nyerere hydropower station](#) in Tanzania.

Solar power—the conversion of energy from sunlight into electricity—has an extremely low footprint in the region at the moment. Yet it is now one of the cheapest forms of electricity generation. Most countries in the region have extensive areas [suitable](#) for harnessing this source.

While not enjoying the wind resources of the Earth's oceans and mid-latitudes, [wind farms](#) can be considered in places, and are already in operation, such as in Kenya's [Lake Turkana](#) region.

East Africa furthermore has the Rift Valley and its volcanic activity in places. This offers the opportunity for [geothermal power](#), a technology that converts the intense underground heat associated with cracks in the Earth's crust to [electricity](#). This is already the [leading electricity generation mode in Kenya](#) and could be developed elsewhere.

Given all these factors, investing in a large and expensive nuclear build with uncertain completion timeframes that may end up being way more expensive than projected is ultimately simply not worth it.

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