

Why nuclear power for African countries doesn't make sense

By [Hartmut Winkler](#)

7 Jun 2018

Over the last few years [reports](#) have surfaced of a range of African countries planning nuclear power plants.



Egyptian President Abdel Fattah al-Sisi Russian President Vladimir Putin. Egypt seems likely to be the next African country with nuclear energy. EPA

At the moment, the only nuclear plant in operation in Africa is South Africa's [Koeberg](#), producing 1.86GW of power. This, according to some African leaders, is about to change. Ugandan President Yoweri Museveni recently made the astonishing statement that his country is planning [30GW of nuclear power by 2026](#). That equates to 16 times the current total of nuclear energy on the entire African continent.

Uganda's is only one of a number of countries [interested in nuclear power](#). Russia's nuclear agency [Rosatom](#) has boasted that it's concluded nuclear power memoranda of understanding with [Egypt](#), [Kenya](#), [Nigeria](#), [Sudan](#) and [Zambia](#). [Uganda](#) is also on the list.

Most African countries suffer from [severe](#) electricity shortages. The majority need to double their generating capacity to meet current needs.

According to [International Energy Agency figures](#), Kenya, Sudan and Zambia are primarily dependent on hydroelectric power. A 2.4GW nuclear plant would double their electricity production. Nigeria's dominant energy source is gas, and here it would take a 4.8GW nuclear plant to double its capacity.

Of the countries with Rosatom agreements, only Egypt has any concrete plans in place. A site for a 4.8GW nuclear plant has been identified at [El Dabaa](#), on the Mediterranean Sea, and building is understood to be imminent. In the other countries, the location and scale of the projects have yet to be determined.

[Elsewhere in the world](#) countries like Germany, Belgium and the US are downscaling their nuclear plans or exiting it altogether. The reasons include perceptions of increased risk following the [Fukushima disaster](#) in Japan as well as economic factors.

The cost of electricity generation from solar photovoltaic and wind technologies has come down dramatically. It already

costs less than power produced by nuclear plants and renewable energy is [set to become even cheaper](#).

Given that South Africa has shelved its nuclear plans on [affordability grounds](#), surely less resourced African countries would find investments like this even more difficult?

The loan agreements

Nuclear power agreements are notoriously shrouded in [secrecy](#). But it's possible to get a sense of Rosatom's plans for African nuclear contracts by examining recent examples where details of mutual commitments have become public.

A deal struck with Bangladesh provides a useful benchmark against which to understand other deals that have been done with Russia. In the case of the 2.4GW Rooppur nuclear plant, Rosatom is providing most of a [US\\$ 12.65 billion loan](#). This only covers the estimated construction costs. Interest accrual, possible cost overruns, operations and decommissioning are likely to amount to [more than double](#) of this initial outlay. That makes a total cost of roughly US\$ 30 billion likely.

Egypt's earlier mentioned El Dabaa project has a similar funding arrangement. Here Rosatom has given a loan of [US\\$ 25 billion](#), which again is projected to only cover construction.

For both Rooppur and [El Dabaa](#), the annual interest for their loan is around 3%. In addition, the loan is structured in a way that ensures repayments only start 10-13 years after the loan is made, to continue in annual instalments for 22-28 years thereafter.

The country receiving the nuclear plant initially pays very little, but when the repayments kick in, the country's fiscus and electricity consumers are suddenly faced with a massive burden that most African economies will never be able to meet. By then the 3% annual interest could have increased the amount owed by as much as 40%

The nuclear industry also has a history of [cost overruns and construction delays](#). A country may therefore face a situation where it needs to service a higher-than-expected debt while being unable to recoup funds from electricity sales.

What is equally concerning is that the debt then places Russia in a position where it is able to exert [disproportionate influence](#) over a country's affairs.

[Zambia](#) is eyeing a nuclear plant on the scale of Bangladesh's Rooppur. The plant is expected to cost US\$ 30 billion. Given Zambia's total [annual budget](#) is US\$ 7.2 billion this is clearly unaffordable. If one were to scale the Rooppur cost from 2.4GW to the 30GW nuclear power plants proposed by Museveni, the figure would be 15 times Uganda's annual [GDP of US\\$ 24 billion](#).

Cheaper options

Are there cheaper alternatives to nuclear power to alleviate energy shortages in Africa?

A great deal of hope was placed on the 40GW [Grand Inga](#) hydroelectric scheme on the Congo river. But the project isn't going to come to fruition soon due to [funding challenges](#).

The most promising solution seems to be through multiple [small-scale power production initiatives](#), typically in bio-energy, solar heaters and photovoltaic modules. These provide cheaper electricity than nuclear and are in addition good [job creators](#). With its extensive agricultural sector, all of Africa has great [bio-waste energy](#) potential.

Kenya has shown that there are excellent [geothermal energy](#) extraction possibilities along the Rift Valley.

Many countries, including Egypt and Kenya, enjoy ample sunshine, making them [ideal for solar power](#) generation. With the right incentives, these could drive an African energy generation boom.

This article was originally published on [The Conversation](#). Read the [original article](#).

ABOUT THE AUTHOR

Hartmut Winkler, Professor of Physics, *University of Johannesburg*

For more, visit: <https://www.bizcommunity.com>