

Africa's Developing Nuclear Landscape Holds Potential for Investors

John Shepherd



Africa is continuing to draw interest from potential nuclear investors as more of the region's nations consider the prospects for launching civil nuclear programmes. Much of the interest has been driven by South Africa, which announced its intention to push ahead with building a new fleet of nuclear power plants more than two years ago. South Africa's *Department of Energy* said it aims to select a "strategic partner or partners" for its planned new nuclear programme by the end of fiscal year 2015. The country's existing twin-unit *Koeberg* is the African continent's sole nuclear power plant, but expectations are high that this will change.

Introducing nuclear power to the wider African continent does of course present many challenges – not least the massive upfront investment that would be needed to follow the years of developing technical and regulatory regimes. Then there is the need for a modern and reliable electricity grid infrastructure which, generally speaking, is largely non-existent.

However, nuclear is not a short-term investment prospect but a long-term commitment by all involved. The eventual 'prize' for countries that decide to go nuclear is a package of opportunities that includes security of energy supply, environmental protection and the development of a highly-skilled workforce. For the international nuclear energy community, there are the prospects for a vastly-expanded and lucrative supply chain.

Several nuclear vendor nations have taken part in a 'beauty parade' over the past year to showcase their reactor technologies as part of South Africa's nuclear procurement process. I understand the same potential nuclear development partners are among those already holding informal talks with some of the possible 'nuclear newcomer' nations in the region.

As I have noted, the financial and regulatory challenges that face any prospective nuclear developer are enormous – perhaps more so in Africa. But a report published last by the *Organisation for Economic Co-operation and Development (OECD)* and *International Energy Agency (IEA)* also pointed to some data that might give African projects an added dimension. The special edition of the *OECD/IEA's World Energy Outlook (WEO)* confirmed that sub-Saharan Africa (SSA) includes "three of the 10 largest uranium resource-holders in the world" – Namibia, Niger and South Africa.

The WEO said that while exploration has increased uranium resource estimates over the last decade, prevailing prices dictate when mining commences. However, SSA's "resources are relatively accessible, regulators are flexible and labour costs are low, resulting in it providing a significant share of global production (18 %)". Namibia currently provides around 8.2 % of global production, followed by Niger (7.7 %), Malawi (1.2 %) and South Africa (1.1 %).

So who could form part of Africa's new nuclear generation ...? Nigeria, which is Africa's largest economy, wants to include nuclear power in its energy mix to meet increasing demand for electricity and support economic development. Nigeria's government approved a national nuclear power 'roadmap and strategy' in 2007. Original government proposals called for the first nuclear power plant to start delivering electricity to the national grid by 2020 – ramping up to around 4,000 MW of nuclear generating capacity by 2030.

Earlier this year, an *International Atomic Energy Agency (IAEA)* team of experts said Nigeria was making "notable progress" in setting up the nuclear infrastructure that would be needed.

The *IAEA's Integrated Nuclear Infrastructure Review Team*, which conducted a two-week review of Nigeria's developments towards launching its nuclear programme, praised the

work to date of the *Nigeria Atomic Energy Commission* and the *Nigerian Nuclear Regulatory Authority*. However, the team said "further refinement of national expectations" was needed regarding "the participation of local human resources and industry in the nuclear power programme, as well as policies on spent fuel and waste".

Namibia, which imports around half of its electricity from South Africa, has also expressed interest in the possibility of launching a domestic nuclear power programme to meet energy needs.

Kenya is being offered "capacity building assistance" to help work towards development of a civil nuclear power programme, a senior Kenyan government official has said. The chairman of the *Kenya Nuclear Electricity Board*, *Ochillo Ayacko*, told China's state-run *Xinhua News Agency* last year that China, the US and South Korea were all offering support as that country considers introducing nuclear to the nation's energy mix.

Separately, an inspector at *Angola's Atomic Energy Regulatory Authority*, *Milton Quissaca Daniel*, recently told an *IAEA* training course that the country will need to consider launching a civil nuclear energy programme "sooner or later". Angola is already engaging with the international nuclear energy community because the country will need "highly-qualified and trained staff", the inspector said.

The training course, which was organised jointly with the *Korea Institute of Nuclear Safety* in Tunisia last May, was the first such event for regulators to be held in Africa. A radiation inspector at the Sudanese nuclear and radiological regulatory authority, *Amany Mokhtar*, also stressed the importance of the course to Sudan – which said in a report to the *IAEA* in August 2012 that a feasibility study had concluded that the launch of a civil nuclear power programme in the country was "feasible and possible".

Sudan is considering introducing up to 8,000 MW of nuclear generating capacity to the national energy mix by 2039.

Algeria also has nuclear aspirations. The state *Algeria Press Service* has quoted ministers as saying Algeria has plans to build the country's first nuclear power plant by 2025. While Algeria's proposals are not specific, and its timetable may seem more than ambitious, the country has signed a bilateral agreement with Argentina to cooperate in the peaceful use of nuclear energy. Nuclear cooperation agreements are also in place with China, France, South Africa and the US.

Ghana too is a contender. *The Ghana Atomic Energy Commission* has said China could be a partner in the planned launch of a civil nuclear power programme under an agreement between the two countries. Ghana has also signed a cooperation agreement with Russia.

According to 'The World Nuclear Supply Chain: Outlook 2030', released at the start of this year by the *World Nuclear Association*, Africa and Latin America could see investments of \$ 20 billion (£ 18.2 bn) and \$ 14 billion, respectively over the next 15 years.

As more African nations take their tentative steps towards embracing the benefits of safe, clean nuclear – and perhaps look to small modular reactor technology and 'mini grid' solutions in particular – international nuclear agencies are right to step up their engagement. Technology vendors and the supply chain should also be thinking about the potential that Africa's new civil nuclear landscape could offer.

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