



## THE AFRICAN URANIUM. GEOECONOMIC COMPETITION AND GEOPOLITICAL RISKS

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### Abstract

*Starting from the premise that uranium is a valued geo-strategic resource and a viable alternative to other energy resources, we tried to demonstrate that Africa has had and still has an important role in the economy and security of many western states. Therefore, as we stem Africa is a western appropriated area that has already been packed with Western, Chinese and, more recently, Indian mining companies we have discussed the position of Iran which turned to uranium deposits in the African southern states, which are socially and politically unstable.*

### Keywords

Uranium,  
geo-economy,  
geopolitics, risk

### 1. Introduction

Along with uranium, thorium is the second radioactive metal naturally present in the earth's crust. Other radioactive elements are in the form of impurities in uranium and thorium ores. At present there is a wide range of research regarding the two radioactive metals. No other element in the periodic table, except gold, was more written about in chemistry and geochemistry than uranium and thorium. The reason why this happened is due to their use as raw materials for the nuclear industry, both constructively and destructively (Boyle, 1982).

The importance of radioactive metals is given by chemical reaction chain processes and heat generation. Each fission resulting in the release of energy form of electromagnetic radiation and kinetic energy. Release energy produces heat to boil water and to generate steam. And electric energy turbines are activated by steam. Thus, electricity is produced in large amounts. For instance, notes Neguț et al. (2002), one gram of uranium emits 20 million Kcal, equivalent to burning 2.5 tons of low rank coal, as specified by the World Nuclear Association website, a single pellet of uranium contains as much energy as 480 m<sup>3</sup> gas, 870 kg coal and 3.5 barrels of oil.

Given the above, with the Second World War, a new pawn appeared on the chessboard of world politics, and that was uranium. Today, radioactive metals, viewed as a whole, store both (economic, political and military) power and hopes. The hope that radioactive metals may represent the alternative to fossil fuels confined

more and more hope. Yet, radioactive metals not only imply civil energy but also military force. All the attention paid to radioactive metals revolves around the possibility of their dangerous use.

The strategies and policies used to access radioactive metal sources (uranium in dominant proportions) tell the story of some of the most coveted natural resources. This story involves a variety of geopolitical actors: states, alliances of countries, companies and international organizations. State actors are of an overwhelming variety. Producing states are not necessarily economically rich countries (South Africa, Mongolia, Namibia, Botswana etc.) nor socially and governmentally solid (Mali, Niger, Uzbekistan etc.), while interested actors are of broadly three types: major world powers (US, France, Russia, China and others), states developing nuclear energy for civil purposes (most states) and the blamed category (Iran, North Korea Israel, Pakistan and India), states that, although develop nuclear programs for electricity production, are driven into non-civil projects in their desire to become fearsome powers.

Starting from the premise that uranium is a valued geostrategic resource and a viable alternative to other energy resources (oil, coal and natural gas), we tried to demonstrate that Africa has had and still has an important role in the economy and security of many states. However, access to the black continent becomes a matter of economic and geopolitical strategy as more and more international actors and companies desire it. Thus, the results of this research have shown

that Africa remains trapped in its relationship with the former Western colonial metropolises, but this changes the unidirectional old trade relations Africa-West as China, India, Japan and perhaps Iran step in increasingly active in the exploration of uranium reserves.

## 2. Research methodology

The African uranium analysis in terms of economic competition and geopolitical risks methodology is structured so as to answer the following questions: (1) who are the main actors on the international state reserves, production and consumption of uranium?; (2) how rich is Africa and African states that are holding proved reserves?; (3) which are and what is the profile of mining companies?; (4) why is uranium so desirable? (5) and, last but not least, what geopolitical risks does uranium involve in terms of the geoeconomic competition for access to African resources?

Reading the literature in various fields of study represented the first part of our research. At this stage the reserves, the production and, to a lesser extent, the consumption of uranium was highlighted, therefore underlining the economic importance of this radioactive metal. Obviously, for an accurate understanding of the specific events in the field we used statistics, with an emphasis on the wealthiest states in this regard. Finally, we conducted a critical analysis of the history and recent events related to access to uranium reserves in Africa, where we can notice geopolitical games related to uranium mining, the role of former colonial metropolis, the incisiveness of new state actors and the companies' portfolios. Geoeconomic and geopolitical events were correlated with the reserves, production and socio-political situation in Africa.

## 3. Research data: reserves, production and consumption

Radioactive metals are extremely popular, mainly due to their energetic power and their main use is in electricity production. Their geographical distribution is an important economic issue. There are only a few countries which own much of their global reserves and production.

Global uranium reserves are viewed differently depending on several technical issues. Classification of reserves is made after a default scheme, which is based on geological certainties and on the operating cost. According to a report by the OECD Nuclear Energy Agency, uranium reserves are divided into two categories of cost: safe exploitable reserves at a small cost of under USD 130/kg of uranium, and safe exploitable reserves at a great cost, up to USD 260/kg uranium. The proven reserves of uranium exploited at low cost are 5.9 million tons of metallic uranium and

those exploited at a great cost are 7.6 million tons of metallic uranium. In terms of uranium demand in 2012, the identified reserves are sufficient to cover the consumption of nuclear power plants for a period of 120 years.

Unlike coal, oil and natural gas, uranium reserves recorded a balanced geographical distribution in relation to the two hemispheres overall (North and South, about 50% - 50%). By far the most important state is Australia (29%). Another rich area is the Commonwealth of Independent States (CIS), and it is concentrated in countries such as Kazakhstan, Russia, Uzbekistan and Ukraine which include 25% of the total (table 1).

Europe is among the poorest geographic regions, its total reserves (excluding Russia and Ukraine) amounts to less than 1% of the total. On the opposite side there are not only Australia but also Asia, Africa and North America. In Asia, except CIS countries, there are two large countries: China (3%) and Mongolia (2%). Africa polarizes the largest amount of uranium deposits stationed in its southern half: South Africa, Namibia, Botswana and Tanzania.

*Tabel 1.* The main countries with proved reserves of uranium (2013)

No.	Country	Cost categories	
		<USD 130/kgU	<USD 260/kgU
1.	Australia	<b>1.706.100</b>	1.798.300
2.	Kazahstan	<b>679.300</b>	875.500
3.	Russia	<b>505.900</b>	689.200
4.	Canada	<b>493.900</b>	650.500
5.	Niger	<b>404.900</b>	404.900
6.	Namibia	<b>382.800</b>	455.600
7.	South Africa	<b>338.100</b>	450.800
8.	Brazil	<b>276.100</b>	276.100
9.	USA	<b>207.400</b>	472.100
10.	China	<b>199.100</b>	199.100

Source: OECD Nuclear Energy Agency

The American continent gathers more than 17% of the world reserves, but there is higher polarization. Only three countries (Canada, Brazil and the United States) take over almost all safe reserves, and only very small quantities are concentrated in Peru, Argentina and Mexico.

World production of uranium is performed in only 21 countries. However, production in Germany, France and Hungary is in very small quantities and it is mainly due to mining activity decontamination. The total production in 2012 amounted at 58.816 tons in metallic uranium. Kazakhstan surpassed Canada in 2009 and remains the world's largest producer of uranium, accounting for over 36% of the total. Production is highly polarized, so that the top five countries account

for almost 80% and the top ten countries accounting production means almost 95% of the total amount.

The scarcity of reserves, the low production cost and the need for uranium as a suitable energy source turn it into one of the most strategic global resources, which is observable in its extraordinary production polarization. An irrefutable proof of global importance is given to this radioactive metal by its producing companies. In Kazakhstan, nearly 70% of production is conducted by state companies, while in Russia, Niger, Ukraine, China, France, Germany, India and Pakistan, the state is the main actor in the production process.

*Tabel 2. The main countries producing uranium (2012)*

No.	Country	Production (tons)	% of the total
1.	Kazakhstan	21.240	36,11
2.	Canada	8.998	15,29
3.	Australia	7.009	11,91
4.	Niger	4.822	8,19
5.	Namibia	4.653	7,91

**Source:** *OECD Nuclear Energy Agency*

Uranium consumption is closely related to power generation in nuclear power plants. Therefore, the countries that produce the largest amount of electricity in nuclear power are those which need more uranium. As, in many states, its production does not meet consumption needs, the need for imports is high. The most important demands of uranium for power plants are in the United States, France, China, Russia, Ukraine and Germany. The United States is by far the largest consumer, as its total consumption amounts to nearly 20.000 tons annually. France, the second largest consumer of uranium which also produces nuclear energy, is far from the US, but consumer demand is entirely imported. Other countries that base their production of electricity on imported uranium only are South Korea, Germany, Sweden, Spain, UK and Japan (OECD Nuclear Energy Agency, 2014).

#### **4. The geoeconomic and geopolitical analysis of African uranium**

##### **4.1. Historical facts**

Africa is as rich in uranium as Central Asia, noting that its reserves are not as concentrated as the Central Asian area. The best phrase to describe the relationship of the two key issues (this subsection) with the world, "uranium" and "Africa", was given by Gabrielle Hecht. It states that '«Uranium» is as underspecified technologically, as «Africa» is politically' (Hecht, 2012: 3). The claims were based on the fact that Africa has been and remains the main source of fuel for nuclear weapons and nuclear reactors worldwide, and examples in this regard are not hard to

find. The author reminds us that the first atomic bomb ever launched, the one in Hiroshima, was made with uranium extracted from the mines Belgian Congo (Democratic Republic of Congo today). Hecht says that each year of the Cold War, between 20% and 50% of the uranium consumed in the West came from African countries: Congo, Niger, South Africa, Gabon, Namibia and Madagascar.

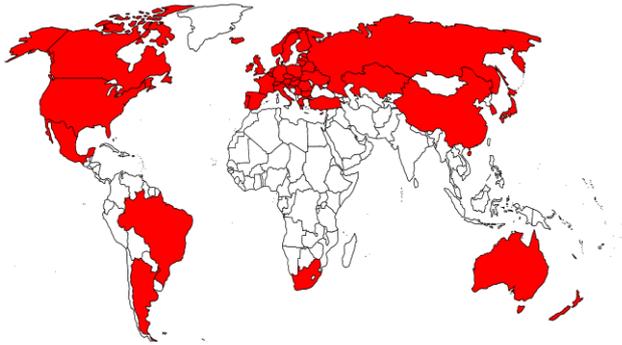
Throughout history, one way or another, Africa has remained linked to former Western metropolises. Colonialism remained an invisible anchor within geopolitical relations between Africa and the West. The British nuclear program has exploited colonial ties with South Africa, with the UK turning a blind eye to the injustices imposed by the apartheid system in exchange for access to rich uranium reserves of South Africa or, as Hecht scored well (2012), 'the defense of the West' legitimized apartheid in South Africa. Great Britain's neighbor and also rival, France, could not to develop nuclear weapons without extracting uranium from its former colonies, particularly from Nigeria and Gabon (Profant, 2010).

##### **4.2. The geo-economic and geopolitical competition for uranium**

But the present is not entirely dedicated to the relationship between the West and Africa, as China, India and even Japan are increasingly interested in African uranium. Until recently, India's trade relations with Africa were limited to just two countries: Nigeria oil and coal South Africa. But to keep up with the other two Asian countries (China and Japan) in the race for securing the supply of uranium for nuclear power, India started to be concerned with producing countries. Over the last few decades India's energy ties have spread to other parts of Africa, especially as the government wants 25% of the country energy to be obtained from nuclear power by 2050. Since 2008, when India was allowed to have trade relations with uranium producing countries, it has sought to do business with African countries. Because of its military nuclear program India has suffered due to the fact that Nuclear Suppliers Group (NSG) (figure 1), which cares for nuclear non-proliferation, agreed not to develop commercial relations based on uranium or nuclear fuel with India. After the signing of several cooperation agreements with the US, France, Russia and Kazakhstan and other countries supplying uranium began to cooperate with India. The first contract for the exploration and exploitation which an Indian mining company has ever concluded outside was in 2007, so one year before thawing relations with Suppliers Group Uranium, and it was received with great enthusiasm by the Hindu press. The Hindu newspaper noted that India will have access to a huge deposit of uranium in Niger that will provide

coverage "for the next 1000 years" (Bagle 2007). Subsequently, India has won a victory in the fight to obtain uranium from African countries. It has signed economic agreements, for the development of the Namibian nuclear energy industry and for the purchase of uranium from Namibia (Pistilli 2009). Thus, India has managed to enter the area of two of the richest countries in the world in this field.

Picture 1. Nuclear Suppliers Group - NSG



On the other hand, another Asian country with high needs of uranium which has penetrated deep into Africa is China. Environmental pressure, given the unprecedented level of pollution in China caused by massive coal burning, forced the authorities to develop the nuclear power industry. For decades China has invested in nuclear energy and the direct access to worldwide sources of supply has driven it to look more insistently to Central Asia and Africa. Chinese companies conducted exploration in Niger, Namibia and Zimbabwe, and the continuous replacement of France by China in the economic field has led some commentators to assert that *Francafrica* is on its way, and its place is being taken *Chinafrica* (Tourré, 2012). However, in mining, China and India are facing and competing with the economic interests of Australia, France and Britain whose companies have taken deep root in the African soil and are very strong with their impressive portfolios. In addition, Australia is one of the major economic and political players in the uranium market. For example, to name but two examples, Paladin Energy and Mantra Resources develop projects in countries such as Namibia, Malawi, Niger and Tanzania. The French company Areva, one of the largest companies in the field of uranium, has several projects in Namibia, Gabon, Central African Republic and Niger. In Niger and Gabon the presence of the French company has a history of over 50 years. Similarly, the UK, with its company Rio Tinto Group attests a long-lasting presence in Namibia and Guinea. Western companies operate some of the most productive uranium deposits in the world: SOMAIR and COMINAK (Niger) operated by Areva, Langer Heinrich

(Namibia) which is 100% in the possession of Paladin Energy and Rossing (Namibia) in the exploitation company Rio Tinto.

Mali and Niger are lying on quicksand as Tuareg rebels and Islamic extremists, being in a constant state of tension, create havoc among governments and companies producing uranium. Niger, the world's fourth largest producer of uranium, has known several tension stages between the two sides, as Tuareg rebels are dissatisfied with the benefits of mining in their areas. On the other hand, there are frequent coups in Mali, the last being in 2012. Such events can easily spread into neighboring Niger, which is equally divided between Muslims and Tuareg extremists.

Iran, Saudi Arabia's main rival in the battle for supremacy in the Islamic area, is interested in West African uranium. President Mahmoud Ahmadinejad visited former Niger, Benin and Ghana, and the last few years have been interpreted by the overseas press (Gladstone, 2013) as enrolling in this direction to ensure access to West African uranium. However, this Western appropriated area has already been packed with Western, Chinese and, more recently, Indian companies. Therefore, Iran attention moved to preempt such deposits in the southern states, which are socially and politically unstable. In these circumstances, the tabloid Daily Mail noted that even Zimbabwe and Iran had signed a secret agreement in this respect, and thousands of tons of uranium should take the path to Iran where it is to be enriched for its controversial nuclear program.

## 5. Final assessments

Africa is rich in uranium reserves and they are not very concentrated as in other geographical areas. This implies that several African countries have significant amounts of uranium, which places them in the sphere of interest of certain states and certain mining companies.

History proves that African uranium remains in a somewhat captive relationship with former Western metropolises, since Western nuclear programs were based on the exploitation of uranium mines from African states. Even if until recently trade partnerships were dictated by the relationship Africa and the West, and only a few Asian countries were active in African mining, this changes the picture as companies from China, India, Japan and possibly Iran increasingly become active in the exploration and exploitation of African uranium.

Thus, it can be concluded that African uranium, does not only represent competition and geo-economic interests for hoarding reserves, but also a lot of geopolitical risks. The most pressing risks hanging over

the uranium-rich African states are the socio-political instability and the nuclear ambitions of various states. The companies undertaking mining prospects in Africa are extremely concerned about the state of permanent tension in western Sahel. In case of conflict both France (the former metropolis) and the US (4% of its imports of uranium coming from Niger) and Saudi Arabia – which has already showed interest in African uranium – could help restore order (Colombant, 2012). Another important finding of our study is that the importance of penetrating an area packed with French, British, Chinese, Australian, American, Canadian and Indian interests prompted Iran to focus on the uranium in states that are situated in the southern part of the continent. Zimbabwe and the Democratic Republic of Congo are the two countries with whom Iran is trying to form partnerships. And as Zimbabwe is under sanctions from several Western countries, cooperation between the two becomes highly probable, as the fragility of the political, social and economic environment in the D.R. of Congo may leave room to smuggling and Iran could take advantage of this situation.

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