

Niger – Africa's Rising Uranium Hotspot

No one much in the West paid much attention to Niger's mining activities before 2003 and hardly anyone knew that Niger was an important uranium producer. All that changed in the run-up to the Iraq War where the "smoking gun" for the invasion of Iraq was the supposed attempts by Saddam Hussein of Iraq to obtain yellowcake from Niger to feed some sort of nuclear program. Subsequently the whole affair proved to be a bogus false-flag operation and the matter degenerated into a morass of lawsuits known as the Plame Affair. It turned out that a former US ambassador had been sent to Niger to investigate the matter but his finding, that it was highly unlikely that Niger had exported any uranium to rogue states, was suppressed. This was too late though for Iraq as the allegations were used as the trigger for the invasion. The Coalition of the Willing turned out to be the Coalition of the Misinformed.

Leading (Sometimes) the Pack

The one thing that was true was that Niger was one of Africa's leading uranium producers, swapping first place over time with Namibia depending on which country was ahead on sales at any time. In 2011, the country ranked fourth (globally) in terms of uranium production by volume, accounting for about 8% of world production.

Niger has been mining uranium since 1971. It is currently the world's fifth largest uranium producer, producing approximately eight million pounds of uranium per year, and its global market share has fluctuated between 5-9% over the last decade. It has accounted for as much as 72% of the country's export revenues. Foreign direct investment in the sector from 2008 to 2012 (the most active period) was estimated to have been US\$1.4 billion.

The Geology

All uranium production in the country comes from sandstone-hosted deposits within sediments of the Tim Mersoï Basin, which are adjacent to and overlie rocks of the Air Massif. At least 13 individual uranium deposits are known in the area. The Tim Mersoï deposits have attractive uranium grades, typically of 0.3% to 0.6%. The abundance of uranium in the district, the attractive grades, and the relative lack of exploration clearly make this area an attractive exploration target.



The uranium deposits in the country are the orange circles in the mid-north of the country.

The rocks hosting the uranium mineralization are commonly arenites of the Carboniferous Guezouman and Tarat Formations. Some beds within the Tchirozerine Formation of Jurassic age and the Irhazer Formation of Cretaceous age also contain uranium. The depositional environment of these formations was fluvial to deltaic, and apparently the uranium was leached from the basement units. Tectonic, lithological and geochemical features are important in trapping the mineralization, which is often of roll-front type, either reduced consisting of pitchblende and coffinite (Akouta, Arlit, Afasto, Madaouela) or oxidized minerals (Imouraren).

The Players

The 800-lb gorilla in the Niger uranium picture is Areva (formerly known as COGEMA). Its properties are:

Compagnie Minière d'Akouta (COMINAK), owned by Areva Group (34%), the Government of Niger (31%), Overseas Uranium Resources Development Co. of Japan (25%), and ENUSA Industrias Avanzadas, S.A. of Spain (10%). This mine produces around 2,000 tonnes of U₃O₈ per annum.

Societe des Mines et de l'Air (SOMAIR) owns the Arlit open-pit mine which is operated by Areva. It mines approximately 1,000 t U308 per annum. SOMAIR was owned by Areva Group (63.4%) and the Government of Niger (36.6%).

Areva also has four uranium projects (Imouraren, Afasto W, Techili and Abkorum), which are in the same area as the two operating mines, are in an advanced stage of evaluation.

Areva's open pit SOMAIR mine, together with its COMINAK underground mine, have produced approximately 240 million pounds of uranium oxide (U308) since 1971 and are the highest grade uranium mines in Africa.

Work began back in 2010 on the Imouraren deposit. The IMOURAREN Inc. exploitation company was established, held 66.65% by a JV of Areva and Korean groups (Areva 86.5% & KEPCO/KHNP -13.5%) and 33.35% by the State of Niger. This project has stalled in the wake of Fukushima but is envisaged as a 36 year mine life with production of 5,000 tpa of U308.



SinoU – a Chinese SOE

In a July 2006 joint-venture, the Nigerien government granted SinoU (China National Nuclear) the rights to develop a uranium mine complex in Azelik in the Agadez region of Niger. The joint-venture, known as Niger Azelik Mining Industry, is co-owned by SinoU (37.2%), the Nigerien Government (33%), ZXJOY Invest (24.8%), Korea Resources – Kores (4%), and Trendfield Energy & Resources (1%). In addition to the uranium mine, the complex will include two coal-fired power plants and a hydrometallurgy plant. On April 24, 2009, the Nigerien government announced that the Exim Bank of China had granted them a preferential loan of Yuan 650 million for the development of the mine. The loan is repayable in 15 years with a 5 year grace period and an interest rate of 2%. The first drum of yellowcake uranium rolled off the production

line in late 2010. Under the original plan the mine was expected to produce 700 tpa of uranium and to increase production to 2,500 tpa by 2015.

Pan African Uranium

Originally the bunch of assets held by this company was ensconced in Homeland Energy Corporation through its subsidiary, Uranium International. When Homeland was backdoored into Western Uranium the African assets were announced to be a spinco in late 2014. However, the website for Pan-African shows it as still unlisted. Originally Homeland's subsidiary had acquired a 100% interest in two exploration licenses in the Republic of Niger. The Agelal license is adjacent to that which hosts the Arlit and Akouta deposits, and represents an area formerly held by Cogema (nw AREVA). Over 36 holes were drilled by Cogema within the boundaries of the current Agelal license, several of which intersected uranium mineralization at depths of between 600-1,000 metres below surface. The Aserka license is located to the immediate southwest, somewhat deeper in the basin, due north of the Teguida uranium deposit and roughly 35 km west of the Imouraren deposit. Niger has also granted eight uranium prospecting concessions to Uranium International Ltd in the northeastern area around Agadez.

Pan African seems to be in somewhat of a listing limbo currently, but when finally set free should be an interesting pure play in uranium in Niger.

Aura Energy (ASX: AEE)

Aura's wholly owned Tim Mersoi Basin applications are located in Northwest Niger and cover 1,500 square kilometres.

The Aura application areas (known as Ebadargene 1, 2 and 3) lie close to and south of the Air Massif and contain a swarm of east-northeast fault structures that, further to the west, contain uranium and associated copper. In the company's view

the application areas appear to contain extensions to known mineralised structures. Fault structures, particularly east-northeast and north-south trending faults, have been influential in transmitting the mineralising ground waters within the Tim Mersoï Basin. An airborne radiometric and magnetic survey has been flown over the Air Massif under European Aid funding and covers much of Aura's northern application area. Seems like not much is happening here for the moment.

Paladin Energy (ASX: PDN, TSX: PDN)

With its main focus on Namibia, Niger clearly takes a back seat. This company's Niger interest is the Agadez project which is located 30km west and north-west of the township of Agadez. It includes three exploration concessions: Tagait 4 (TAG4); Toulouk 1 (TOU1); Terzemazour 1 (TER1); and, one application Ekazan 1 (EKA1), covering in total an area of 990km². The concessions cover sandstone type uranium mineralisation in the Tim Mersoï Basin. At this stage Paladin has suspended all field activities in the Arlit and Agadez areas and a *force majeure* has been requested from the government authorities for indefinite suspension of expenditure requirements.

GoviEx Uranium (CSE: GVX) – Friedland Junior (literally)

It was a meeting with this company a couple of weeks back that perked up our interest in Niger and its potential on the uranium front. Its existing role in the industry was known to me but the extent to which juniors were playing here was not.

It was particularly intriguing that GoviEx was the vehicle of Govind Friedland, the son of Robert Freidland. Much to our surprise the strange name of the company is merely a coincidence. The company is a relatively recent listing dating only from June 2014. Interestingly it chose the CSE over the TSX-V. This is no small project with over \$100mn having been

spent on it so far between \$30mn in acquisition costs and \$70mn in exploration work. Neither is the project fledgling as GoviEx in its private manifestation has been working on the project since 2007. The company has undertaken a rather stunning 581,000 metres of drilling so far, so like every Friedland family project, nothing is being skimmed.

The main prospect is Madaouela, which is in the main prospectivity zone for uranium in Niger and in close proximity to the aforementioned Arlit mine of Areva. The Probable Mineral Reserve is 54.88mn lbs at 0.098% U3O8.

The proposed base case envisions an average 2.53mn lb per year U3O8 yellowcake production rate over an eighteen year mine life, with an 83% ultimate recovery of uranium. The base case project economics for this project at a long-term uranium price of USD 70 /lb U3O8 are positive, and indicate an after-tax NPV of US\$251mn (at an 8% discount rate) with an IRR of 21.9%. Initial capital costs are estimated at US\$339mn, total life of mine capital costs at US\$646mn, and cash operating costs of US\$33.10 per lb U3O8 including royalties.

The shareholder list is A-grade with Govind Freidland holding 21.36%, Toshiba with 19.42% and Cameco with 8.55% (even Semafo is in the mix with 6.7%).

So capex here is chunky and opex is flirting with the levels at which uranium is currently trading in the spot markets. This implies that nothing much is likely to happen in the short term as far as production decision is concerned. The company is not fazed though as it has a tie-up with Toshiba and is clearly focusing on proving up the deposit and plans for its development and "awaiting the turn" in the uranium price like so many others. As "failure" is not in the Friedland family phrase book and "too big" is not employed either, GoviEx remains something to watch for eventually becoming a reality.

Orezone (TSX: OZN) – Bulking Up

Orezone Resources owes its position in uranium in Niger to a merger of its uranium interests in Niger with those of North Atlantic Resources Ltd (TSX: NAC). In late 2009 the two groups signed a definitive agreement whereby Orezone acquired three uranium exploration licenses in the Republic of Niger, West Africa, from North Atlantic to create Brighton Energy Ltd. Prior to this Orezone's wholly-owned subsidiary, Niger Resources, had been granted two uranium exploration permits in Niger. The two permits totaling 980km² were located adjacent to Areva's exploration permits and within 40km of Areva's SOMAÏR and COMINAK uranium. The permits, named ZELINE 1 and ZELINE 4 are within the Tim Mersoï sedimentary basin. In late 2010 and early 2011 drilling (twelve holes in 2011) intercepted uranium mineralization above a lower cut-off 100ppm of U308, with eight of the holes intersecting more than 200 ppm of U308. Drilling (in 2010) of the Guezouman-Talak Formation, which is the host rock of the neighboring Cominak mine and Madaouela deposits, was consistently mineralized within a 6 km² zone at depths from 112 to 182 m.

The new discovery was considered to be shallow and amenable to open pit mining, and is also largely associated with reduced rocks that are typically amenable to standard extractive processes.

In 2012, Orezone consolidated all of Brighton Energy into its main structure by offering Orezone stock to the minority holders. As uranium was out of favour, one scarcely sees mention any more of the Niger properties in the Orezone promotional material.

Conclusion

To most distant watchers of Uranium, the name Namibia rings a bell but Niger scarcely raises an eyebrow. Besides its more controversial (and involuntary) bit-part role in one of the

most sleazy false flag operations ever, it frequently has out produced Namibia and may yet do so again in terms of uranium output. Thus far production has been centred on deposits owned by the French giant Areva and JVs with a heavy Chinese SOE component, however rising companies like GoviEx and temporarily sidetracked ones like Aura Energy and Homeland/Pan African give Niger the potential to return to number one ranking in Africa and a shot at being in the world's top five producers within the next ten years.

The existing production of Areva and China National Nuclear mines combined with Areva's and GoviEx's projects could boost uranium production capacity to over 10,000 tpa within five years from the present 4,500 tonnes. This would put Niger definitively ahead of Namibia in the African U308 stakes.

Now all we need is for uranium prices to come to the party.