



# A Brief Review of Uranium Mining in Africa

by Oliver J. Schatz

Uranium is currently mined in [Niger](#) and [Namibia](#) and is recovered as a by-product of [gold mining](#) in [South Africa](#).

In addition to possessing enviable quantities of [platinum](#), [gold](#) and [diamonds](#), as well as significant amounts of other [commodities](#), the [African continent](#) has its fair share of [uranium](#). The radioactive metal is currently mined in [Niger](#) and [Namibia](#) and is recovered as a by-product of [gold mining](#) in [South Africa](#). It was previously mined in [Gabon](#), the [Democratic Republic of the Congo](#) and [Madagascar](#), as well as in [Zambia](#), where it was recovered as a by-product of copper mining.

[Africa](#) accounted for just under one sixth of the world's [primary mine production](#) of [uranium](#) in 2007. With additional production anticipated from planned expansions at operating mines, as well as from projects expected to come online in the near term, Africa is poised to become a more important player in the arena of uranium production.

In 2007, the wave began. The world's newest conventional open-pit uranium mine, [Langer Heinrich](#), in Namibia, was officially opened in March 2007 and achieved nameplate production in December of the same year. Stage two production expansion is underway and is scheduled for completion at the end of 2008. The past-producing [Dominion Reefs](#) underground mine in South Africa

was reopened and produced its first [ammonium diuranate](#) in May 2007. Although commercial production has not yet been reached, mainly due to feed constraints from slower than expected rates of underground development, a feasibility study on the proposed expansion of the project is underway.

## 2007 Facts and Figures

According to data from the [World Nuclear Association](#), published in July 2008, 15.9% of the world's primary mine production of uranium came from Africa in 2007, with mines in [Niger](#), [Namibia](#) and [South Africa](#) collectively producing 6,571 tonnes of uranium (U) or 7,749 tonnes (about 17.1 million pounds) of  $U_3O_8$ . In comparison, the world's top three uranium-producing countries, [Canada](#), [Australia](#) and [Kazakhstan](#), accounted for 23%, 20.9% and 16.1%, respectively. Individually, Niger and Namibia were ranked 5th and 6th producing 7.6% and 7.0%, respectively, while South Africa produced 1.3% for 11th place.

The top African uranium producer in 2007 was the [Rossing](#) open pit mine in Namibia with 6.3% of the world total and a fifth-place ranking in the world. [Rio Tinto](#) has a 69% interest in [Rossing Uranium](#), the operator of the mine. The

second and third ranked uranium-producing operations in [Africa](#) were at Arlit and Akouta in Niger, accounting for 4.2% and 3.4% of the world total for sixth and eighth place, respectively. [AREVA NC](#), the wholly-owned subsidiary of French nuclear giant [AREVA](#), operates both mines through a 63.4% interest in [Somair](#) (Societe des Mines de l'Air) that mines open pit deposits at Arlit and a 34% interest in [Cominak](#) (Compagnie Miniere d'Akouta) that mines underground deposits at Akouta. The remaining uranium production in Africa came from three mining operations which collectively made up 2% of the world's primary mine production of uranium. [AngloGold Ashanti](#) produced about 1.15% as a by-product of its gold mining operations in the Vaal River region of South Africa, while approximately 0.72% came from [Paladin Energy's](#) flagship [Langer Heinrich](#) open pit mine in Namibia and roughly 0.16% came from pre-commercial production at [Uranium One's](#) Dominion project in South Africa.

African production in 2007 was 6.6% less than in 2006, when Africa produced 7,035 tonnes U (~ 18.3 million pounds  $U_3O_8$ ). The decrease in production resulted from lower output from both [Niger](#) (-8.2%) and [Namibia](#) (-6.1%), offsetting



**View from plant towards the open pit at Paladin Energy's Langer Heinrich uranium mine in Namibia. (Courtesy of [Paladin Energy](#))**

the slight increase from [South Africa](#) (0.9%). Coupled with the 4.7% increase in world output, led by the 13.4% and 25.7% surges in production of [Australia](#) and [Kazakhstan](#), respectively, the African share of world production declined to 15.9% from 17.9% in 2006.

In Niger, the 11.8% increase in production at Arlit was not enough to offset the 24.9% drop at Akouta and caused Niger to fall to fifth place in 2007 from fourth in 2006. Namibia stayed put at sixth place despite a 15.8% drop in production at Rossing and a slow ramp up at the newly commissioned Langer Heinrich mine. South Africa remained firmly in 11<sup>th</sup> place. Pre-commercial production at Dominion compensated somewhat for declining by-product uranium production from gold mining operations in the Vaal River area.

## Explosive Beginnings

[Uranium](#) was discovered at [Shinkolobwe](#) around the time of the First World War in what is now the [Democratic Republic of the Congo](#) (formerly called the [Belgian Congo](#) and later renamed [Zaire](#)). The mine eventually supplied much of the uranium needed for the [Manhattan Project](#) that resulted in the development of the atomic bombs that were used on [Hiroshima and](#)

[Nagasaki](#) to end the Second World War, which underscores the controversial nature of the radioactive metal. The mine was shut in 1960 when it ceased to be profitable. [Artisanal miners](#) continue to work a few hundred metres away from the old mine site, although most are now looking for cobalt. However, uranium can also be extracted from the ore.

In southeast [Gabon](#), uranium's potential to generate vast amounts of energy was confirmed in the early 1970s when the ore from the [Oklo](#) orebody was found to display characteristics similar to spent fuel from today's [nuclear fission reactors](#). Scientists surmised that a [natural phenomenon of self-sustaining nuclear reactions](#) occurred about 1.7 billion years ago, when groundwater began percolating down into a uranium mineral deposit that was enriched in the fissile isotope of uranium ([uranium-235](#)). Discovered in 1968, the Oklo orebody eventually produced over 14,000 tonnes U (36.4 million pounds  $U_3O_8$ ).

## Producing Mines in 2007 Rossing

The fifth largest uranium producer in 2007, the [Rossing](#) open pit mine, is operated by Rossing Uranium in which Rio Tinto has a 69% interest. The remaining

31% is divided among the [government of Iran](#) (15%), [Industrial Development Corporation of South Africa](#) (10%), the [government of Namibia](#) (3%) and individual shareholders (3%). The government of Namibia, however, has a 51% majority interest in the voting rights.

Located near the town of Aranis in the [Namib Desert](#), about 70 km northeast of Swakopmund in Namibia, Rossing was discovered in 1928. Production began in 1976, and the conventional open pit currently measures about 3 km by 1.2 km and is about 345 m deep. The ore is hosted in [alaskitic granite](#).

Rossing was scheduled to close in 2009 after years of working below capacity due to a downturn in the [uranium market](#) and low [uranium prices](#). At the end of 2005, however, based on increases in the uranium price since 2003, the decision was made to restore production capacity to 3,385 tonnes U (8.8 million pounds  $U_3O_8$ ) per year and extend the life of the mine to 2016 and then to 2021.

In 2007, 21.4 million tonnes of rock were mined and 12.6 million tonnes of ore were processed to produce 2,583 tonnes U (~ 6.7 million pounds  $U_3O_8$ ). Production in 2007 represented a 15.8% decrease from 2006 and was below the target of about 3,433 tonnes U (~ 8.9 million pounds  $U_3O_8$ ). The shortfall was mainly attributed to a narrower open pit, increased stripping in preparation for mine expansion and lower head grades. The production target for 2008 is about 3,395 tonnes U (~ 8.8 million pounds  $U_3O_8$ ).

The proposed expansion program consists of two phases. Phase 1, for which environmental clearance has been received, would include the construction of an on-site [sulphuric acid](#) production plant and a [radiometric ore sorter](#) plant, as well as the mining of the SK4 pit, a small satellite pit within the larger SK area. Phase 2 would consist of the construction of a [heap leaching](#) facility, an extension of the existing SJ open pit and new mining activity in the SK area, along with increased waste rock and [tailings](#) disposal facilities, and construction of a sulphur handling facility at the port of Walvis Bay.

## Arlit

Located near the town of Arlit on the western edge of the Air mountains, about 800 km northeast of Niamey in [Niger](#),

## Reserves and Resources of Uranium Mines in Africa

## Uranium Mineral Reserves

PROVEN							
Country	Site / Project	Operator	Tonnes	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal
			(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )
Malawi	Kayelekera <sup>1</sup>	Paladin Energy	1,780	1.21	1.43	2,157	5.61
Namibia	Rossing <sup>2</sup>	Rio Tinto	19,600	0.42	0.50	8,310	21.61
Namibia	Langer Heinrich <sup>1</sup>	Paladin Energy	16,700	0.59	0.69	9,837	25.57
Niger	Cominak <sup>3</sup>	AREVA	1,350	4.58	5.40	6,183	16.07
Niger	Somaïr <sup>3</sup>	AREVA	7,216	2.22	2.62	16,049	41.72
South Africa	Dominion (under-ground) <sup>4</sup>	Uranium One					
South Africa	Mine Waste Solutions (Buffelsfontein) <sup>5</sup>	First Uranium	99,400	0.07	0.08	7,049	18.33
South Africa	Vaal River (Great Noligwa) <sup>6</sup>	AngloGold Ashanti	9,900	0.29	0.34	2,868	7.46
South Africa	Vaal River (Kopanang) <sup>6</sup>	AngloGold Ashanti	5,100	0.29	0.34	1,483	3.86
South Africa	Vaal River (Moab Khotso) <sup>6</sup>	AngloGold Ashanti	1,200	0.26	0.31	303	0.79

## Uranium Mineral Resources\*

MEASURED							
Country	Site / Project	Operator	Tonnage	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal
			(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )
Malawi	Kayelekera <sup>1</sup>	Paladin Energy	2,200	1.05	1.24	2,316	6.02
Namibia	Rossing <sup>2</sup>	Rio Tinto	2,700	0.18	0.21	481	1.25
Namibia	Langer Heinrich <sup>1</sup>	Paladin Energy	22,720	0.54	0.64	12,409	32.26
Niger	Arlit Concession	AREVA					
Niger	Cominak <sup>3</sup>	AREVA					
Niger	Cominak (other) <sup>3</sup>	AREVA	1,763	3.53	4.16	6,223	16.18
Niger	Somaïr <sup>3</sup>	AREVA	11,037	0.87	1.03	9,578	24.90
Niger	Somaïr (other) <sup>3</sup>	AREVA	11,201	0.75	0.88	8,378	21.78
South Africa	Dominion (under-ground) <sup>4</sup>	Uranium One					
South Africa	Dominion (surface dumps) <sup>4</sup>	Uranium One					
South Africa	Ezulwini <sup>5</sup>	First Uranium	4,940	n/a	n/a	1,495	3.89
South Africa	Mine Waste Solutions (Buffelsfontein) <sup>5</sup>	First Uranium	99,400	0.07	0.08	7,049	18.33
South Africa	Vaal River (Great Noligwa) <sup>6</sup>	AngloGold Ashanti					
South Africa	Vaal River (Kopanang) <sup>6</sup>	AngloGold Ashanti					
South Africa	Vaal River (Moab Khotso) <sup>6</sup>	AngloGold Ashanti	1,400	0.67	0.79	916	2.38

\* inclusive of reserves, except for AREVA and Rio Tinto projects

1. Paladin Energy–2007 Annual Report and online project brochures

2. Rio Tinto–2007 Annual Report

3. AREVA–Reference Document 2007

4. Uranium One–2007 Annual Information Form (gold data omitted)

5. First Uranium–2008 Annual Information Form

6. AngloGold Ashanti–Supplementary Information: Mineral Resources and Ore Reserves 2007 (by-product uranium)

## Reserves and Resources of Uranium Mines in Africa

## Uranium Mineral Reserves

PROBABLE					TOTAL RESERVES				
Tonnage	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal	Tonnage	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal
(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )	(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )
8,680	0.86	1.02	7,491	19.48	10,460	0.92	1.09	9,647	25.08
130,600	0.30	0.35	38,761	100.77	150,200	0.31	0.37	47,071	122.38
8,600	0.57	0.67	4,664	12.13	25,400	0.58	0.68	14,416	37.48
5,107	3.79	4.47	19,351	50.31	6,457	3.95	4.66	25,535	66.39
509	2.87	3.38	1,460	3.80	7,725	2.27	2.68	17,509	45.52
18,450	0.65	0.77	12,050	31.33	18,450	0.65	0.77	12,050	31.33
226,000	0.06	0.07	14,016	36.44	325,400	0.07	0.08	21,066	54.77
6,600	0.27	0.32	1,813	4.71	16,500	0.28	0.33	4,681	12.17
11,200	0.29	0.34	3,277	8.52	16,300	0.29	0.34	4,761	12.38
20,200	0.34	0.40	6,785	17.64	21,300	0.33	0.39	7,087	18.43

## Uranium Mineral Resources\*

INDICATED					INFERRED				
Tonnage	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal	Tonnage	Grade U	Grade U <sub>3</sub> O <sub>8</sub>	Contained Metal	Contained Metal
(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )	(kt)	(kg/tonne)	(kg/tonne)	(tonnes U)	(M lbs U <sub>3</sub> O <sub>8</sub> )
13,110	0.70	0.83	9,229	24.00	3,400	0.51	0.60	1,730	4.50
114,900	0.22	0.26	25,333	65.86	73,700	0.17	0.20	12,499	32.50
14,460	0.47	0.55	6,730	17.50	43,400	0.49	0.58	21,505	55.91
					12,845	1.59	1.88	20,403	53.04
391	3.37	3.97	1,316	3.42	7,838	2.56	3.02	20,102	52.26
1,354	2.84	3.35	3,843	9.99					
717	0.70	0.83	501	1.30	3,226	2.98	3.51	9,627	25.03
334	2.68	3.16	895	2.33					
81,080	0.53	0.63	43,239	112.42	174,795	0.31	0.36	53,215	138.35
2,953	0.12	0.14	346	0.90					
5,010	n/a	n/a	1,108	2.88	201,460	n/a	n/a	83,974	218.32
235,700	0.06	0.07	14,402	37.44	21,200	0.08	0.10	1,786	4.64
18,600	0.47	0.56	8,887	23.10	1,800	0.35	0.41	628	1.63
17,000	0.65	0.77	11,195	29.11	800	0.53	0.63	444	1.16
17,600	0.62	0.73	10,898	28.33	4,300	0.75	0.88	3,215	8.36



the property includes the Ariege, Artois and Arlette (initial Somair lease) and the Tamou, Takriza, Tamgak and Taza (SMTT lease) [sandstone-type uranium deposits](#), discovered starting in 1965.

Formed in 1968 to mine the deposits, Somair (63.4% AREVA NC and 36.6% government of Niger through Onarem – Office National des Ressources Minières du Niger) has produced more than 44,000 tonnes U (~ 114.4 million pounds  $U_3O_8$ ) from a series of shallow (up to about 70 m deep) open pit mines since 1971. Ore is processed on site at the Arlit mill, with a production capacity of 2,000 tonnes U (~ 5.2 million pounds  $U_3O_8$ ) per year. In 2007, 1,750 tonnes U (~ 4.55 million pounds  $U_3O_8$ ) were produced, an 11.8% increase over that of 2006. Somair is currently developing a 1.4 Mtpa heap leach operation for the Artois deposit.

## Akouta

Located near the town of Akokan and up to 10 km south of the deposits at Arlit, Akouta was discovered in 1967. It is an underground operation that exploits horizontal sedimentary uranium deposits at about 250 m depth. The main deposits are Akouta and Akola.

Cominak (34% AREVA NC, 31% government of Niger through Onarem, 25% [Japan Overseas Uranium Resources Development Co.](#) and 10% [Enusa Industrias Avanzadas S.A. \(Spain\)](#)) was formed in 1974 to mine the deposits and has produced more than 55,000 tonnes U (143.0 million pounds  $U_3O_8$ ) since 1978. Ore is processed on site at the Akouta mill, with a production capacity of 2,000 tonnes U (5.2 million pounds  $U_3O_8$ ) per year. In 2007, only 1,403 tonnes U (~ 3.65 million pounds  $U_3O_8$ ) were produced in 2007, representing a 24.9% decrease from 2006 production. Cominak is currently switching production to the new deposit at Ebba/Afasto.

## Langer Heinrich

With construction and staged commissioning completed on time and on budget at the very end of 2006, the [Langer Heinrich](#) uranium project became the first new conventional uranium mining and processing operation in the world in over a decade.

Discovered in 1973, the project is located in the [Erongo region](#) of west-central

Namibia, approximately 85 km east of Swakopmund and about 40 km south-east of the Rossing mine in the Namib desert. Mineralization is near surface, [calcrete-hosted](#) and in the form of [carbonate](#). The deposit has a strike length of about 15 km and consists of seven higher grade pods within a weaker mineralized envelope.

Paladin Energy acquired the project in August 2002, completed a Bankable Feasibility Study in April 2005, commenced staged commissioning in August 2006 and shipped its first [yellowcake](#) in March 2007. Nameplate production, initially forecast for July 1, 2007, was only achieved in December 2007, due to equipment failures in January 2007, which caused a slower than anticipated ramp-up. Production for 2007 was therefore only about 770,000 pounds  $U_3O_8$  (~ 297 tonnes U).

With the mine now producing at its planned stage one rate of 2.6 million pounds  $U_3O_8$  (1,000 tonnes U) per annum, based on a mill throughput design of 1.5 Mtpa of ore, work on the stage two production expansion to 3.7 million pounds  $U_3O_8$  (~ 1,423 tonnes U) per annum is progressing and is scheduled for mechanical completion by the end of 2008. The conceptual design of a proposed stage three expansion to increase production to 6.0 million pounds  $U_3O_8$  (2,308 tonnes U) is underway.

## Dominion Reefs

Located 20 km southwest of Klerksdorp and 150 km southwest of Johannesburg in the North West, a province of South Africa, the Dominion Reefs conventional underground uranium and gold mine is divided into two operating areas – the Rietkuil and Dominion sections. Mineralization is stratabound and occurs in extensive and narrow (up to 2.5 m thick) [quartz-pebble conglomerate units](#) (“reefs”). Mining dates back to 1898.

Uranium One began developing the project in 2006 and completed a new uranium processing plant to which existing refurbished infrastructure was tied in 2007, so that both uranium and gold could be recovered. The plant has a throughput capacity of 2.4 Mtpa and can produce more than 3 million pounds  $U_3O_8$  (~ 1,154 tonnes U) per year. Uranium One is currently exploiting the Upper and

Lower Reefs of the Dominion Group from the Rietkuil and Dominion sections by a combination of trackless mining (off reef) and conventional mining (on reef) and is also processing surface tailings from previous mining operations to maximize the use of plant capacity.

The first underground ore was processed in February 2007, with the first ammonium diuranate (ADU) precipitating in the plant in May and the first shipment of ADU to the [Nufcor calcining](#) facility occurring in July. The pressure leach circuit was commissioned in December.

In 2007, pre-commercial production from Dominion consisted of about 171,000 pounds  $U_3O_8$  (~ 66 tonnes U) from the milling of underground ore and the processing of surface tailings material. This was less than the expected (in excess of) 200,000 pounds  $U_3O_8$  (~ 77 tonnes U) suggested in October, 2007 and was attributed to slower than expected underground development during the year, resulting in the plant operating below throughput design.

In February 2008, production guidance for 2008 was accordingly lowered to 590,000 pounds  $U_3O_8$  (~ 227 tonnes U) from 2 million pounds  $U_3O_8$  (~ 769 tonnes U) in October 2007, to take into account electrical power supply disruptions, equipment breakdowns, higher than expected mining dilution and lower than expected grade for the surface tailings.

Uranium One's 100% interest in the project is subject to Micawber 397 (Proprietary) Limited, a company owned by [historically disadvantaged South Africans](#) who have the right to acquire an undivided 26% interest.

## Vaal River

AngloGold Ashanti produces uranium as a by-product from its underground gold mining operations near the town of Orkney in the Vaal River area of South Africa. The Vaal River operations comprise the [Great Noligwa, Kopanang, Tau Lekoa and Moab Khotsong mines](#) and collectively produced about 1,230,000 pounds  $U_3O_8$  (~ 473 tonnes U) in 2007, down about 11% from 2006.

Great Noligwa, Kopanang and Moab Khotsong are located on the Free State side of the Vaal River, while Tau Lekoa is situated on the North West Province side. Mining is conducted over eight main



**Rio Tinto's Rossing open pit uranium mine in Namibia, in operation since 1976, was the world's fifth largest uranium producer in 2007. (Courtesy of [Rio Tinto](#))**

levels at an average depth of 2,400 m at Great Noligwa and at depths ranging from 1,350 to 2,240 m at Kopanang and from 2,600 m to 3,054 m at Moab Khotso, exploiting primarily the Vaal Reef as well as the secondary Crystalline Reef. At Tau Lekoa, mining is conducted principally on the Ventersdorp Contact Reef at depths ranging from 800 m to 1,743 m. In each case, a scattered mining method is used due to the geological complexity of the orebody.

The Vaal River South uranium plant is currently being upgraded and commissioning is expected in 2009. Uranium production is also expected to ramp up at the Moab Khotso mine, along with improved recoveries.

## New Producers in 2008

### Ezulwini and Mine Waste Solutions

In South Africa, [First Uranium](#) is in the process of reopening and developing the Ezulwini underground uranium and gold mine and is planning to recover both gold and uranium as part of the Mine Waste Solutions (Buffelsfontein) tailings project, located about 40 km west and 160 km southwest of Johannesburg, respectively.

At Ezulwini, production of uranium and gold ore commenced in April 2008,

with the ore stockpiled on the surface. The 1.2 Mtpa uranium plant commenced commissioning in June 2008. However, the first ADU recovery will be delayed from August 2008 until October 2008, due to the late delivery of certain equipment.

At Mine Waste Solutions, the construction of a new 7.8 Mtpa uranium and pyrite flotation plant, as well as a new 7.8 Mtpa gold plant and associated 1.5 Mtpa uranium plant, is on schedule to commence commissioning in December 2008 as part of the Phase 1B expansion.

First Uranium acquired the projects from Simmer & Jack Mines in December 2006. Majority shareholder [Simmer & Jack](#) owned 62.3% of the common shares of First Uranium as at Dec. 31, 2007.

### Kayelekera

Located in northern Malawi, about 40 km west of Karonga, the [Kayelekera](#) sandstone- and mudstone-hosted uranium deposit was discovered in the early 1980s. Paladin Energy formed a joint venture with unlisted Australian company Balmain Resources in 1998 and ultimately acquired a 100% interest in 2005. The [Government of Malawi](#) currently has a 15% carried interest in the project, pursuant to a [February 2007 Development](#)

[Agreement](#) with Paladin, granting Paladin certain tax and royalty concessions for at least 10 years to ensure fiscal regime stability and project certainty.

The bankable feasibility study (BFS) for [Kayelekera](#) was accepted in February 2007 and outlined an 11-year project based on ore reserves within a single open pit. The BFS provides for the production of 3.3 million pounds  $U_3O_8$  (~1,269 tonnes U) per year over a scheduled mine life of seven years based on a mill throughput design of 1.5 Mtpa of ore and a 90% recovery. Marginal material will then be processed to produce 1.17 million pounds  $U_3O_8$  (450 tonnes U) per year over the last 4 years of the project. Payback of initial and working capital is estimated at 30 months based on a constant price of US\$60 per pound  $U_3O_8$  over the 11-year period.

Construction of the project, which began in April 2007 following receipt of a mining license and environmental approval, is currently on schedule and on budget. Commissioning is slated to commence at the end of 2008, with production ramping up in early 2009.

## African Uranium Pipeline

In [Namibia](#), construction is underway at AREVA's [Trekopje](#) uranium project,

which was acquired in last summer's friendly takeover of [Uramin](#), with production planned towards the end of 2009. AREVA is also fast-tracking its massive Imouraren project in Niger where an operating permit is expected in 2008 and production is estimated for 2011/2012. Together, output from these two projects may add as much as 8,000 tonnes U (20.8 million pounds U<sub>3</sub>O<sub>8</sub>) per year to African uranium production.

In Zambia, commissioning of the uranium processing plant at [Equinox Minerals' Lumwana](#) copper-uranium project is planned for 2010. In Namibia both [Forsys Metals](#) and [Bannerman Resources](#) are anticipating production at their respective alaskite-hosted uranium projects by the end of the decade. Bannerman recently commissioned a full feasibility for its [Goanikontes](#) project, for which a detailed scoping study estimated production at the end of 2010, while Forsys just received environmental clearance for the [Valencia](#) project and envisions production near the end of 2009.

Other important projects on the continent likely to come on stream in the near-term include AREVA's Bakouma and Ryst Kuil projects in the Central African Republic and South Africa, respectively. Both were acquired through AREVA's acquisition of Uramin and were expected to be in production in 2009. In addition, [Mintails](#) is proposing to recover uranium from surface mine tailings dumps in South Africa starting in the fourth quarter of 2009.

## On the Horizon

Despite being the poorest continent in terms of [gross domestic product per capita](#), Africa, as a whole, is comparatively rich in mineral as well as petroleum resources. In fact, several of its countries derive a substantial portion of their [gross domestic product](#) and an even greater proportion of their export income from the exploitation of these natural resources. According to the [Economic Commission for Africa's Economic Report on Africa 2008](#), "overall, African industry is still dominated by mining and crude oil in terms of production and exports."

At a time when the world requires a [safe, clean, reliable, competitive](#) and environmentally-friendly alternative to [fossil fuels](#) to help satisfy the [burgeoning energy needs of a growing and urbanizing population](#), the [outlook for Africa from a uranium mining and mineral exploration point of view](#) could not be better. As well as in Niger, Namibia, South Africa and Malawi where uranium mining is occurring or development is underway, exploration for the radioactive metal is ongoing throughout Africa, and accumulations of uranium that may be economic have already been delineated in many of those countries, including [Botswana](#), [Tanzania](#) and [Zambia](#). ■

## Links and References

- [AllAfrica Global Media](#)
- [AngloGold Ashanti Limited](#)
- [Areva](#)
- [Areva NC](#)
- [Australian Uranium Association](#)
- [Bannerman Resources Limited](#)
- [BioMineWiki](#)
- [Botswana](#)
- [Cameco Corporation](#)
- [Cameroon](#)
- [Creamer Media's Mining Weekly](#)
- [Democratic Republic of the Congo](#)
- [Economic Commission for Africa](#)
- [Enusa Industrias Avanzadas S.A. \(Spain\)](#)
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