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Uranium resources and potential of the Republic of Niger

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Following the discovery of the first occurrences of Uranium in Niger in 1958, the French undertook a systematic and detailed exploration programme from 1959 to 1980 in the north part of the Lullemeden basin (114 000 km²). This has led to the discovery of other occurrences and worldwide uranium deposits. Two Palaeozoic basins (Djado and Emi Lulu) have shown also good uranium potential.

In 1971, the Company of the Mines of Air (SOMAIR) and later in 1978 the Company of the Mines of Akouta (COMINAK) has begun the production of uranium with a cumulative production of 125 000tU.

From 1973 to 1980 and following the spectacular increase of the uranium price and the growing of the demand, many oil and mining companies have been granted a uranium exploration tenement (permit). Many occurrences have been listed, explored and evaluated. The following deposits have shown an economic interest: Arlette, Ariège, Taza, Tamou, Takriza, Artois, Tabellé, Imouraren, Irhawenzegirhan, Azelik, Madaouela, Ebene, Akouta, Akola, Ebba.

Later and following the spectacular increase of the uranium price and the growing of the demand, the exploration work interrupted since a decade has restarted in 2002: 120 exploration permits have been granted to more than forty mining companies in Niger.

- Geological background: all mineralization economically viable is localized in clastic sedimentary formations (conglomerates, sandstone and siltstone) rich in organic matter and sulfides, formed during the carboniferous age to the cretaceous age. The redox and tectonic evolution phenomena in the northern region of Niger have played a decisive role in the formation of the different deposits along with the sedimentological and stratigraphic control.
- Mineralization: In the Tim Mersoï Basin, the uranium is mainly present under its own mineralogical forms, of which the mainly identified are minerals part of the primary group: pitchblende - uraninite and coffinite. Its presence in the crystal lattice of clay or other minerals is rarely observed. However, the secondary minerals yellow products (gummites, uranotile, tyuyamunite, autunite) exist in particular at Azelik and Imouraren deposits. The average ore grade of the deposits from Niger varies between 0.08 %U and 0.6%U.
- Resources: despite the fact that 125,000 tU have been removed over the past 40 years, there are still significant global resources in Niger, estimated at around 515,000 tU, of which 315,000 tU being proved as economically recoverable reserves, and 200,000 tU as probable and inferred resources.
- Prospect: the exploitation of Imouraren (230,000tU recoverable) and Azelik (13,700 tU) deposits is underway near the lineament of Arlit and its satellites. A detailed exploration with new effective methods will allow the discovery of other deposits around many existing occurrences within the following licenses: Madaouela, Adrar Imoles, Afasto, Toulouk, Terzemazour, Tagait, Asamaka, Agelal, Zéline.

Conclusion: Niger is on the way to become the world's third-ranked country with regard to available uranium resources and production, and could keep this position for several decades.

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