

Uranium Requirements for French Electric Power

Nuclear Non Proliferation

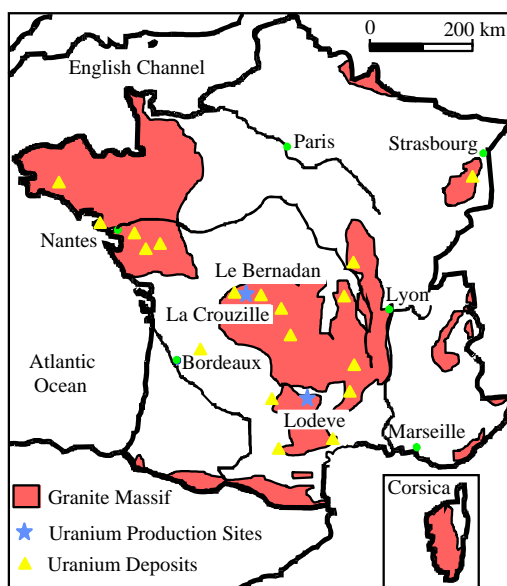
Australia and France signed a bilateral nuclear safeguards agreement on 7 January 1981 which stipulates that uranium from Australia be used only to generate electricity and not for nuclear weapons. The Federal Government decided to resume sales of uranium to France in August 1986 and Government approval for ERA to supply France with uranium over a fourteen year period was granted. France signed the Nuclear Non Proliferation Treaty (NPT) in August 1992. The Comprehensive Test Ban Treaty is yet to be finalised, France has said it will support the ban following the current series of six nuclear weapons tests.

Exploration for Uranium in France

Prospecting for uranium in France commenced in 1946 and the La Crouzille deposit in central France was discovered in 1948. Further deposits were identified by 1955, as shown in Figure 1. Subsequently, the French have achieved an independent nuclear arsenal and fuel for one of the world's major nuclear power programs. In comparison, the existence of uranium ore in Australia has been known since 1894, and before 1930 ores were mined at Radium Hill and Mount Painter in South Australia.

The geological occurrence of economic uranium deposits in France is limited to Permian granites and localised Permian and later sediments in north west and central France. Individual uranium deposits in France are small and of relatively

Figure 1 : Uranium Production Sites in France

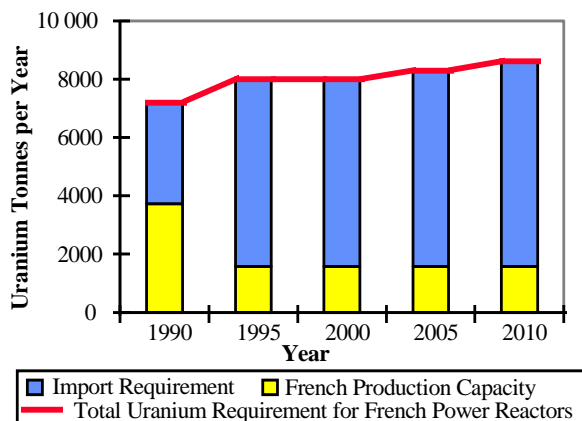


Source : *Uranium Resources, Production and Demand (Red Book)*, OECD and IAEA 1993.

low grade, while deposits in Australia (and elsewhere) are of a higher grade and larger scale. The prospects for expansion of both French resources and production are limited by this geological restriction.

France has spent more on uranium exploration than any country except

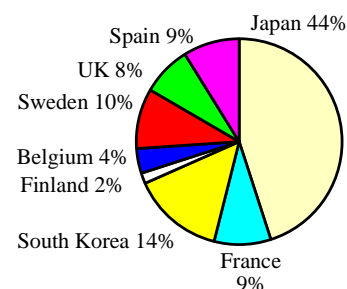
Figure 2 : French Reactor Requirements, 1990-2000



Source : *Uranium, Resources, Production and Demand (Red Book)*, OECD and IAEA 1993.

the United States. The French Government subsidised uranium prospecting and exploration between 1977 and 1981, for a total of about \$51 million. Due to the geological and economic limitations associated with uranium deposits in France, contemporary exploration is limited to known deposits and mining areas. French mining companies have also redirected their exploration activities abroad and are involved in prospecting activities in Australia, Canada, Spain and the United States.

Figure 3 : Uranium Exports from Australia, 1994



Active mining involvement is limited to Canada, the United States and France itself, while indirect investment is present in other countries which supply uranium to France.

French Uranium Production and Resources

Identified resources of French uranium have diminished since the removal of the government exploration subsidy in 1981. Mine closures and the failure of the limited exploration

effort led to an eight percent decline in known resources between 1991 and 1993.

Mine production of uranium in France fell from 2 149 tonnes in 1992 to 1 720 tonnes in 1993, yet in 1989 production capability was 3 920 tonnes per annum. The tendency for France to reduce indigenous production and increase uranium imports is unlikely to be reversed. France has 5000 tonnes of uranium available from Gabon and Niger per annum, together with other imports.

France's uranium processing occurs at the Bernardan and Lodeve mines, with additional mining at La Crouzille. All French uranium production is carried out by private companies in which the government is a major shareholder through the parent company, these are, SAE, Cogema and TCMF. SAE is a subsidiary of Electricite de France (EdF). The company holds mining rights in France but would only commence mining if the price of imported uranium increased substantially.

Uranium Requirements

France has a total of 56 nuclear reactors connected to the grid and four under construction. France obtains over 75 percent of its electricity from nuclear power and is the world's largest electricity exporter. The forecast uranium requirements increase from about 7 800 tonnes uranium per annum in 1992 to 8 000 tonnes in 1995 and until 2000, then an increase to 8 600 tonnes per annum by 2010, as shown in Figure 2. Details regarding uranium prices in France are maintained as commercial-

in-confidence, owing to the fact that there are only two principal uranium producers (COGEMA and TCMF) and one principal consumer (EdF). There is no tariff barrier to imports; thus uranium from the better overseas deposits can readily price substitute for the expensive indigenous production.

Uranium Stocks

EdF possesses emergency uranium stocks, the minimum level of which has been fixed at the equivalent of three years' forward consumption to face possible supply problems. French uranium supply is based upon the diversification of sources under short or long term contracts. Production of uranium from indigenous sources is more than adequate for French nuclear weapons programs.

Australian Exports of Uranium to France

EdF purchases uranium from Australia at a set price under a long term contract signed in 1988. The contract expires in 2001 and is for 272 tonnes of uranium per annum worth about \$12 million. Uranium is supplied by Energy Resources of Australia (ERA) from the Ranger mine, 230 km east of Darwin in the Northern Territory. ERA is majority Australian owned, but Cogema has an 8.3 percent interest in the company. Since the French are paying about double the spot market price for uranium, sourcing it from alternatives would save about \$40 million over the remaining contract term.

Australia's uranium sales to France constitute less than 3 percent of EdF's annual requirements. Australia would lose about \$72 million in export income and the Common-

wealth could be liable to compensate ERA if the exports were cancelled. ERA recognised the sensitivities associated with French nuclear testing, a 20 container shipment of uranium oxide bound for France in September was cancelled. Improvements in the global uranium market have led ERA to a resumption in full uranium production, planned for February 1996. Australia's other operating uranium mine at Olympic Dam mine in South Australia does not export uranium to France. From 1984 to 1994, Australia exported 43,000 tonnes of uranium oxide with a value of some \$3 020 million to ten countries. Figure 3 describes Australia's export markets in 1994, the French were supplied exclusively under the ERA-EdF contract.

Sources: Uranium, Resources, Production and Demand (Red Book), OECD and IAEA 1993. Briefing Papers, Uranium Institute of Australia, September 1995.

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