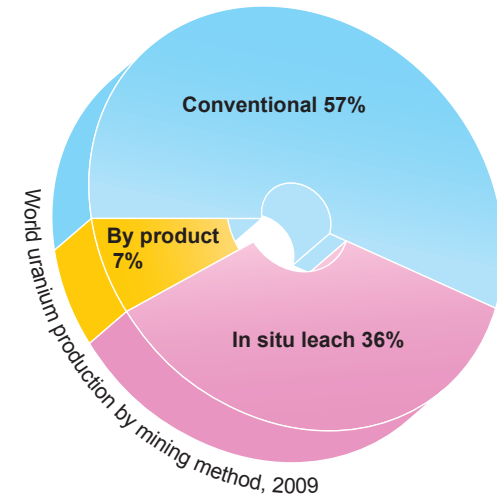




URANIUM, FROM MINE TO MILL



Uranium history

- In 1789 Martin Klaproth, a German chemist, isolated an oxide of uranium while analysing pitchblende samples from the Joachimsthal silver mines in Bohemia.
- For over 100 years uranium was mainly used as a colorant for ceramic glazes and for tinting in early photography. Uranium was produced in Bohemia, Cornwall, Portugal and Colorado and total production amounted to about 300-400 tonnes.
- The discovery of radium in 1898 by Marie Curie led to the construction of a number of radium extraction plants processing uranium ore (radium is a decay product of uranium).
- Prized for its use in cancer therapy, radium reached a price of 750,000 gold francs per gram in 1906 (US\$10 million). It is estimated that 754 grams were produced worldwide between 1898 and 1928. Uranium itself was simply dumped as a waste material.
- With the discovery of nuclear fission in 1939, the uranium industry entered a new era. On 2 December 1942, the first controlled nuclear chain reaction was achieved in Chicago. The first nuclear explosion in 1945 demonstrated the enormous power potential of nuclear fission.
- From a small beginning in 1951, when four lightbulbs were lit with nuclear electricity, the nuclear power industry now supplies some 14% of world electricity.



McArthur River – world's top producing uranium mine in 2009

Uranium production and resources

Country or area	2009 production (tU)	Capacity (tU) at 31.12.09	Uranium resources (tU)* < US\$80/kg
Australia	7982	9550	714,000
Brazil	345	400	157,400
Canada	10,173	11,810	329,200
China †	750	1000	44,300
Czech Republic	258	440	600
India †	290	300	n/a
Kazakhstan	14,020	15,000	344,200
Namibia	4626	5000	145,100
Niger	3234	3500	44,300
Pakistan †	50	50	n/a
Romania †	75	100	n/a
Russia	3564	3750	172,400
South Africa	563	2000	205,900
Ukraine	840	1000	126,500
USA	1453	2000	99,000
Uzbekistan	2429	2500	55,200
Other	112	n/a	n/a
Total	50,772	58,400	2,438,100

Sources: WNA, OECD/NEA

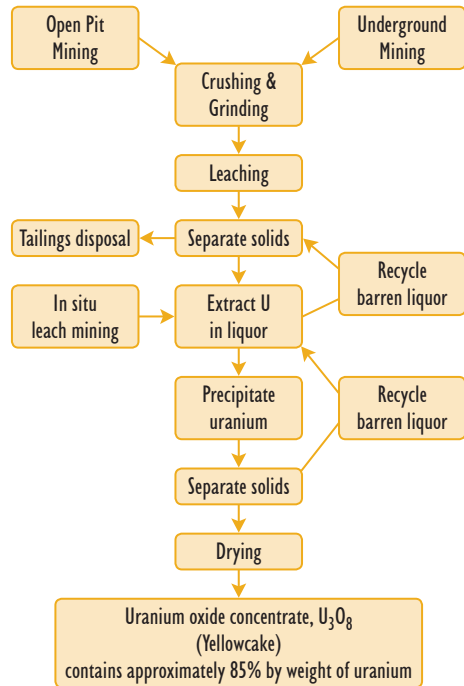
* OECD/NEA Reasonably Assured Resources Category

† WNA estimate

NB Many other countries have also known uranium resources

Milling

Simplified flow chart of uranium ore processing from mining to the production of concentrate. These processes are commonly known as milling and the product – uranium oxide concentrate – is the raw material for making nuclear fuel.



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