



The Uranium Institute 24th Annual Symposium
8-10 September 1999: London

Uranium in 1999: The End of the Roller-Coaster Ride?

Daniel Comte & Georges Capus

You get what you pay for! This common sense translation of the law of thermodynamics seems sometimes to be forgotten. Indeed, it was really surprising to read in mid 1999, in a biweekly nuclear publication, that some utility representatives were complaining about “a formidable concentration of supply in the uranium market”. Looking at the proceedings of the last twenty Uranium Institute Symposia, one can read a plethora of warnings about the shrinking number of actors in the uranium industry, the associated concentration of the market, and related topics.

Of course, prior to 1981, nothing was noted on this subject. But then, uranium prices were much higher! But from 1982, there has been virtually no Uranium Institute Symposium where one could not find at least one presentation emphasising the effects of the deterioration of the market: reduction of exploration expenditure, lack of investment in new production, disappearance of small producers, cutbacks and deferrals, concerns about the viability of the US uranium industry, delay of new projects, changes in the mining and milling industry in the USA, etc.

The early 1990s was a turning point, as buyers appeared to realise that the shortfall could be satisfied from non-Western sources, leading to a further contraction and consolidation of the Western uranium production industry. The remaining primary production could consequently only be provided from either well capitalised operations based on large, low cost reserves, or from relatively cheap in situ leaching or by-product sources. In the meantime, secondary supplies were stepped up. This resulted in a volatile market in the mid 1990s, which was named “The Uranium Market Roller-Coaster” by Phillip Crowson at the 1996 Symposium.

The result of this evolution is obviously a disappearance of a large number of economically fragile mines and consequently a concentration of production within a reduced number of production centres, leaving almost nothing today (less than 5%) for the producers not belonging to the Western top 20 (or 12% in the case of a global market). However, the globalisation of the uranium market has lessened, at least temporarily, the effects of the disappearance of small and mid size mines in the Western world by adding several additional mines in these categories in the Commonwealth of Independent States (CIS) and Eastern European countries (Figure 1).

During this evolution, dramatic changes occurred within the top 20 production centres. From 1986 to 1998 nine mines closed definitively, and we estimate that up to nine more could follow by 2005. Only one large mine entered into production in this interval: Olympic Dam. Two others were decided upon, McArthur River and McClean Lake, which are coming on stream in 1999. The other newcomers in the top 20 were small ISL operations such as Crow Butte or Smith Ranch.

The Surviving Uranium Miner Paradox

This leads us to the paradox of the surviving uranium mining companies: they are coping with a persistently depressed uranium market but remain confident about the future.

A Disappointing Market

Uranium producers who survived the plummeting prices of 1995–96 and who thought prices had at last bottomed out were, to their bitter disappointment, proven wrong in 1997 and 1998. Nothing much is changing in 1999. Spot prices have been driven downward again, reaching historical low levels.

Among reasons for this evolution were the replenishment of the almost exhausted excess inventories from certain government stockpiles and various other sources, a further reduction in excess utility security stockpiles, and, last but not least, the confidence of market participants that high enriched uranium (HEU) feed would come to the market under the US–Russia HEU Agreement, regardless of the lack of signatures on a commercial agreement.

As a result, primary production, which had somewhat revived, resumed its contraction, and new exploration, which had surprisingly started to blossom, faded prematurely.

Again, severe measures were taken by uranium producers. Additional closures, production suspensions and further industry concentration were announced and implemented or are still pending. Production was reduced even at low cost mines and projects were delayed. This was not just a knee-jerk response, but a really serious situation for producers, and the operating earnings posted by the mining companies are well in line with this situation.

Strategic Move Needed

At the end of 1998, it became evident to Cogema that the market had become accustomed to a large share of secondary supplies, and that such material was still potentially abundant. In addition, deregulation of the electricity markets could serve as a good reason to reduce government inventories by selling into the market (Figure 2). As a result, there was a high probability that the market would remain difficult for at least several years. For a producer, the viable strategic options appeared very few. The alternatives were to leave the business or to strengthen your position.

At Cogema, we decided to strengthen our position. We then set ourselves some goals which had to be reached if we were to remain a major producer in the long run:

- Reinforce our resource basis in the best categories, in order to enhance our mid-term competitive position.
- Start production at our ongoing projects, which in addition to an existing target was a financial obligation.
- Become a partner in the Russian HEU feed deal, in order to have access to a new long-term source of supply, which could be, in that respect, compared to and considered as a new mine.

These three major targets were reached during the first half of 1999. These successes were stimulating, in a year which could figure among the gloomiest vintages for the uranium industry, with primary production regressing towards only 50% of total world requirements.

Acquisition of Uranium Interests

When market prices are low, a number of opportunities become available to those who believe in the future of nuclear energy. This is especially true in the field of uranium mining. Among recent events, a very significant deal was announced by Cogema Resources Inc (CRI) on 5 May 1999. Under this transaction, selected uranium assets, all located in Saskatchewan (Canada) were acquired from Cameco with effect as of 1 January 1999 (Table 1). This transaction strengthens CRI's resource base with high grade ores.

The main assets acquired by CRI are a further 14% interest in the McArthur River Project and a 17% interest in the Key Lake Project, where the McArthur River ore will be milled beginning year end 1999. At the same time, an additional 0.725% interest in the Cigar Lake Project was bought by CRI from Korea Electric Power Corporation.

Development and New Mine Construction

The Cogema Group's orebody development programmes, i.e. drilling evaluation grids and pilot tests, are essentially limited to Canadian projects in Saskatchewan and to new ventures in Central Asia (Kazakhstan and Uzbekistan) (Table 2).

Construction of new mines is at the moment basically limited to Saskatchewan:

- McClean Lake, where mining started in 1997, but which has only recently received final approval to start milling operations, due to various delays related to the licensing and construction of the tailings disposal facility.
- McArthur River, where commercial mining operations are scheduled to start at the end of 1999.
- Key Lake mill, where the operator, Cameco Corporation, started a refurbishing programme in mid 1999 in order to begin processing McArthur River ore by the end of 1999.
- Cigar Lake, which has a startup date scheduled around 2002, depending, among other factors, upon market conditions and licensing.

In Central Asia, Cogema is involved in several new projects:

- In Kazakhstan, in association with Kazatomprom, an acid ISL pilot is scheduled to enter into production in 2000.
- In Uzbekistan, with the Navoi Combinat, a feasibility study using the alkaline ISL method is in progress.
- In Mongolia, extensive exploration is being carried out.

The foregoing projects are the result of years of involvement in exploration with various partners. Such types of projects are naturally the preferred sites when the time comes to make new investment choices or when a window of opportunity opens.

The HEU Feed Component Commercial Agreement

After more than five years of intergovernmental (Russia and the USA) and commercial negotiations, a commercial agreement was signed between Techsnabexport (Tenex), on one side, and Cameco, Cogema and Nukem, on the other. The market analysts were unanimous in qualifying the process as lengthy. But it can be recalled that five years is quite a short period compared with the time required to put a uranium project into production after its discovery, not even speaking of exploration.

This agreement, duly approved by the US and Russian governments, enables the purchase by the three Western companies of natural uranium in the form of UF₆ belonging to Russia and derived from dismantled Russian nuclear weapons. This weapons derived material is being delivered to North America under a 20-year agreement, known as the HEU agreement, signed in late 1993 between the USA and Russia.

The commercial agreement will contribute to the implementation of this “swords to ploughshares agreement”, and thus represents a major commitment of the civilian nuclear industry to reduce nuclear weapon grade material stockpiles. This commercial agreement also provides a way for this huge quantity of material to be sold onto the uranium market, through large producers and in a fair manner, as well as ensuring that Russia is fairly repaid for its efforts toward the reduction of nuclear arsenals.

In addition to that, the commercial agreement will help lift the enormous uncertainties that had clouded the outlook for the uranium market before it was signed. This will be beneficial not only to the signatories, but also to all market participants.

The commercial agreement represents for Cogema an exclusive right to purchase a maximum of about 43 000 tU as natural UF₆ (111.8 million pounds U₃O₈) over the next 15 years (starting in 1999). According to US law, and pursuant to the commercial agreement, about one half of this quantity could be delivered to US end users. For Cogema and Cameco (the quantities available are potentially the same for each), the commercial agreement could provide a supply equivalent to a new large uranium mine. For Nukem, it gives access to a secure long term source of supply. Thus it can be seen as turning a secondary source of supply into a new kind of primary supply.

Will This Uranium be Sold Normally in the Market?

Under the currently difficult market conditions, the implementation of this agreement may bring headaches and nightmares if not properly managed, both by the individual signatories and by market supervising authorities. However, the HEU feed component does not carry the marketing constraints which apply to other uranium of CIS origin. US quotas are such that this material will soon be considered as free from US import restrictions, and Euratom's intention is to allow HEU feed component sales in Europe with no restrictions.

Cogema will consider this supply as if it were part of its own production and will market it as such. For this reason, it is not viewed as secondary supply, which would be sold through the secondary market. It is clearly managed and will be marketed as fresh production, mainly through long-term contracts and in accordance with market demand.

Mitigating Risks in an Increasingly Risky Market

What are the Risks?

From a market perspective, there are risks tied to each source of supply, including the output from production centres as well as the products in the secondary market.

As far as production is concerned, risks can be related to social, technical, environmental or political events which may cause temporary problems. The magnitude of these risks has increased in recent years and continues to grow, since new projects are planned to reach 7000 tU/year quite soon — a single mine may then account for 15% to 20% of total expected world production. As most of such mines are being developed in Saskatchewan there is potentially a significant country risk in this Canadian province. This risk also exists in Australia, the second largest producing country, where new mines are currently being built, but where opponents are still very active (Figure 3).

Concerning the Russian HEU feed component, the signing of the commercial agreement has alleviated most of the risks by removing a large part of the marketing uncertainties.

A major risk remains the lack of knowledge about the size of inventories. Most of the data are not available and it is difficult to estimate properly their quantity and availability. If one considers that most of the supply in the secondary market comes from these inventories, the related risk is in our opinion significantly underestimated by some market participants.

Is Market Concentration a Serious Risk?

Compared with the situation prevailing 15 years ago, the number of uranium producers is clearly lower. However, the number of producers owning the top 20 mines is quite constant (12 in 1986, 11 in 1990, 12 again in 1998).

It is true that the share of production of the top producers is increasing. However in the case of the uranium industry, we believe contraction is a more appropriate word than concentration, since the situation is more the result of the closure of uneconomic mines and reduction of primary uranium supply than the result of a conquest strategy from large producers. For the time

being, we believe that most producers are struggling more just to stay alive rather than to increase their market share.

A comparison with other commodities or services shows that the uranium market is not yet at such a level of concentration as to be the subject of concern, and even that the margin before it does become so is still quite significant. Witness the fact that recent consolidation has had no effect on prices, which have continued to drop.

A reasonable level of concentration could lead to enhanced efficiency and contribute to the reduction or at least the stabilisation of costs of production. In order to survive and to remain in the market, the remaining producers have already for some years been making cost reductions, and have already or are in the process of shutting down their most costly mines. Only these producers are now likely to be well placed to invest in large new projects. In preparing the way for their future, we believe that they are also assuring the future supply of their customers.

This evolution is a response by individual uranium producers to the need to lower their costs. This is even more crucial in a period of intense competition in the nuclear power industry, exacerbated by the deregulation of many key electricity markets.

In order to mitigate risks, Cogema has always oriented its policy toward geographic diversification, with interests in Canada, Africa and Central Asia. In addition, there is today the HEU feed component. This policy provides our customers with much better security of supply.

A New Landscape

As a consequence of years of crisis and the conclusion of the HEU feed agreement, a new production landscape is emerging. This combines a new geographical spread of production areas due to some newcomers (including some from the CIS), an increase in size of the main production centres, and the arrival of a “mine” of a new kind in the form of the HEU feed component.

The market is more and more global, since significant producing countries from the former USSR are gradually changing, particularly in the uranium business. In fact, the CIS countries should no longer be considered as a whole. For various reasons some are rapidly evolving toward a market economy, while others are moving more slowly. The right for foreign companies to acquire ownership in uranium properties and mines, coupled with the possibility of exporting their share of production, are criteria of major importance. Today, Kazakhstan and Uzbekistan have clearly declared their intentions to move in this direction.

Are We at the End of the Roller-Coaster Ride?

Two factors are likely to act as market moderators:

- The HEU deal involves a very large amount of material. It is going to be introduced into the market through mechanisms which should ensure it enter the market smoothly without sharp variations in supply. It can almost be considered today as a primary supply.

- Some new large mines are being brought on stream with large and stable production. Their owners are strongly involved in the uranium business, making huge investments and, we believe, working with a view to the long term.

However, for various reasons, mainly environmental issues and related administrative processes, the response time to open new mines is now quite lengthy and unpredictable, requiring significant investment and reasonable prospects of reward. Reactive production flexibility will be limited to a small set of large mines.

Above all is the fact that primary production now accounts for only around 50% of consumption, or around 65% in the future if one includes the HEU feed component. Thus the market today remains highly dependant on non-production supplies, for which the long term availability is unpredictable. Even if one considers that some supply uncertainties have been lifted, a lot are still pending. We think that we will certainly still have to live with the roller-coast ride risks for a while.

Utilities as well as uranium producers seek effective ways to hedge such risks. We at Cogema have always believed that a sensible solution to better accommodate these risks is diversification and long term commitments. This remains our policy.

Table 1. Cogema interests in selected projects following recent acquisitions.

Property	Cogema ownership 1999 %	Total uranium tU	Average grade % U	Cogema share tU
McArthur River	30.195%	185 800	12.1%	56 100
Key Lake	16.667%	4 769	0.95%	795
Cigar Lake	37.1%	135 900	11.5%	50 400
Midwest	76%	16 000	3.9%	11 200

Table 2. Cogema Group major uranium mining subsidiaries and ventures.

Name	Country	Cogema ownership	Note
Pathfinder Mining Corp.	USA (Wyoming)	100%	Completing site reclamation
Cogema France	France	100%	Completing site reclamation
COMUF	Gabon	68.42%	Closed in early 1999 / under reclamation
Société des Mines de Jouac	France	100%	Producing, closure by 2001
Cluff Lake	Canada (Sask.)	100%	Producing, closure by 2000
MALCO	USA (Wyoming)	71%	Producing
COMINAK	NIGER	34%	Producing
SOMAIR	NIGER	61.4%	Producing
McClellan Uranium Ltd	Canada (Sask.)	70%	Started production in mid-1999
McArthur River Project	Canada (Sask.)	30.195%	Scheduled for starting production by late 1999
Key Lake Mining	Canada (Sask.)	16.667%	Scheduled for starting milling McArthur ore by late 1999
KATCO	Kazakhstan	45%	Pilot test scheduled for 2000
Cigar Lake Mining Corp	Canada (Sask.)	37.1%	Scheduled for starting production by 2002
Midwest	Canada (Sask.)	76%	Scheduled for mining after 2005
Koongarra	Australia (NT)	100%	Project on hold
Sissons Schultz	Canada	99%	Project on hold & exploration

Figure 1. Evolution of the production share of the top 20 uranium producing centres.

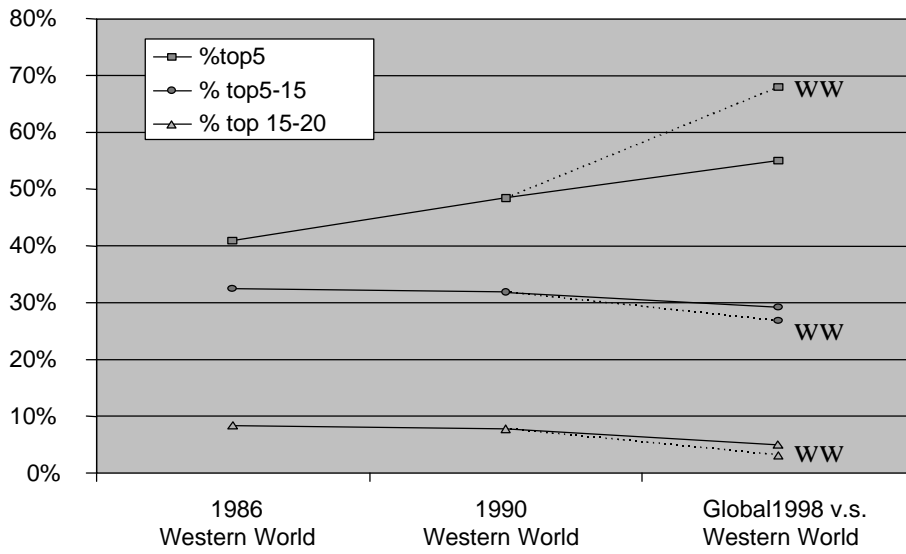


Figure 2. Uranium supply evolution.

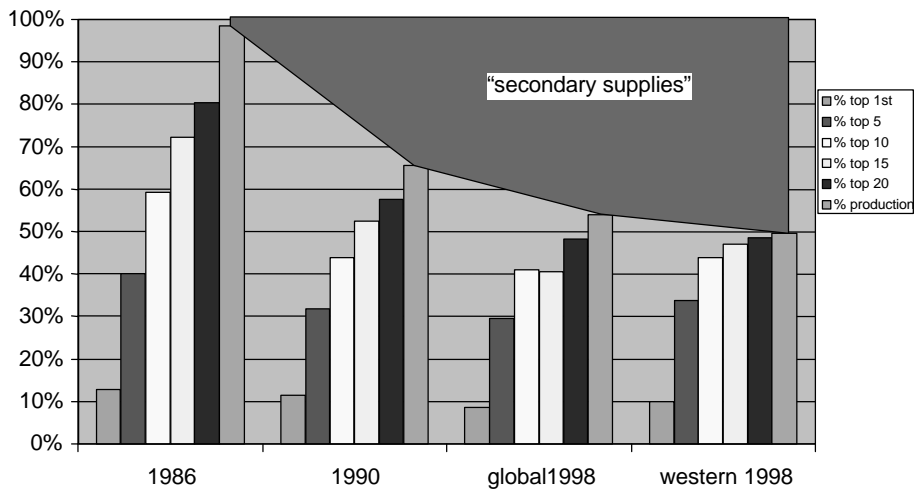


Figure 3. Projected western uranium production.

