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The Supply Elasticity of Uranium

From time to time over the balance of this year, we plan to look at concepts that are important from the standpoint of uranium price formation. This week, we examine the concept of supply elasticity and what it means for uranium supply and the market.

One of the key determinants of future uranium prices is the supply elasticity of uranium, or the extent to which uranium supplies can respond to an increase in uranium prices over a specified period of time. As an example of its significance, in its recent study on the economic future of nuclear power, the University of Chicago noted that the supply elasticity of uranium is estimated to be between 2.3 and 3.3 and based on this concluded that this "should be sufficiently large to keep uranium prices down in the range of $15 per pound over the next several years."

Basically, this estimate means that uranium production will increase two to three times as much as the price increases (the concept of supply elasticity is discussed further on page 2). Of course, supply has not responded in this fashion recently, and as a inventories, with the latter three components essentially being inventories of one form or another. As has often been pointed out, only about half of uranium supply comes from production, with the other half from inventories.

Signs of a production response -- Typically, when we think of supply elasticity for uranium, we think of how much production can respond to changes in price. Recently, there have been some encouraging signs that production from existing or planned mines is responding or will respond to higher prices. Here are some recent examples of possible expansions that have been disclosed of late:

Mine*	Current	Planned
	(million pounds U3O8)	
McArthur River	18	22
Highland/Smith	1.8	4.0
Inkai	2.6	5.0
Kazatomprom	8.0	15

* According to company estimates; the time frame of any expansion varies.

Note that much of this additional production is in Kazakhstan, where there is talk of expanding the Inkai and Muyunkum projects even before they get into production. (Additional Kazakh production is most likely subject to further "outside" investment, Production expansion will also take place in the United States. In addition to the potential expansion at PRI/Smith Ranch, both URI, Inc. and Cotter are embarking on new production, with Cotter production essentially coming from existing mines while URI is producing at a new ISL venture at Vasquez. In addition, URI is looking to resurrect the Kingsville Dome ISL project in Texas and bring on the Churchrock project in New Mexico.

Production expansion issues -- There are a number of cases where producers are trying to resurrect projects that produced in an earlier period. However, as pointed out by Thomas Neff at his recent paper at the WNA symposium in London, the inventory of such projects is now much less than it was in the 1970s when production responded rather robustly to the increase in price during that period.

Of course, for the planned expansion of existing production centers to come to fruition depends on producers receiving the requisite amount of investment support and getting the proper

consequence the uranium price is now much higher than $15, on both a spot and long-term basis. Given that this is the case, we can ask why hasn't supply responded more than it has and what is the true nature of uranium supply elasticity.

It is instructive to think of supply elasticity for uranium in terms of the different components of uranium supply instead of one measure for total uranium supply. Uranium supply today consists of production, HEU products, enriched tails, and commercial however, as discussed recently by Dr. Moukhtar Dzhakishev in a paper at the WNA symposium in London). Canada also represents potential expansion, especially to the extent that output from McArthur River can be ramped up. Of course, Cigar Lake represents even more production in Canada, although some of this just replaces or extends existing production. regulatory approvals. In addition, in measuring the supply elasticity for most projects, it is necessary to look at prices expressed in the home currencies of producers, and these currencies have not appreciated as much as the U.S. dollar. The prime example of this is Rössing, where a decision to extend production beyond a couple of years or expand production has been put off for some period despite the rapid dollar increase in the price.

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