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Game Changers and Their Impact on the Uranium Market

Last week, we talked about developments to watch for during 2013. This week, we will focus on the status of a handful or so of what we call “game changers” that have impacted the uranium market (or have the potential to impact the market) over a number of years. Individually, these developments affect hundreds of millions of pounds of supply or demand, and together the total runs into the billions of pounds when viewed over a period of a couple of decades. In the past, we have referred to these as “sea changes” and “tectonic shifts” in the market, with the implication that they have far-reaching effects.

The Rise of China – The effect of China’s entry and expansion on the market has been enormous. It was a driving force behind the decision of hedge funds to go long in uranium, helping to drive price to unprecedented heights in 2007. Even after price reversed course and headed into the \$40s, a resurgence of Chinese buying propelled price back into the \$70s just before the Fukushima accident. More recently, the price pullback can be attributed to a certain degree to reduced buying by China as its nuclear power expansion took a pause while safety reforms were implemented.

Now China’s nuclear power program is seemingly back on track, one question is whether China will resume its buying binge or be more content with the supply arrangements that it has already put in place. At a minimum, China’s resumption in nuclear power growth can be seen as positive for the market; looked at another way, a curtailment could have been devastating.

The Rise of Kazakhstan – Another huge development since around 2000 has been the increase in Kazakh uranium production, with exponential growth starting in 2004. Kazakhstan has accounted for over three-quarters of the net growth in production since 2000 and now accounts for almost 40% of world uranium production. Without this growth, price would have gone to much higher levels than it did in 2007 and would be much higher today.

Going forward, Kazakhstan is still looking to expand production, but the vast majority of its production growth has already occurred, leaving it up to other countries to add uranium production capacity. Continued expansion and especially maintenance of Kazakh production levels is vitally important to the uranium supply situation and the future of nuclear power. Like the case with China, a stumble here could have a dramatic impact on price, except this would be in the other direction.

The HEU Deal – Besides being an important non-proliferation initiative, the HEU deal has brought a considerable amount of nuclear fuel (uranium, conversion, and enrichment) into the market. Over the course of the HEU deal, over 400 million pounds of uranium were generated.

As we know, the HEU deal is going away this year, and with it the associated uranium supply. This exit will have the largest impact on the uranium market and the least impact on enrichment, because in recent years it took about as much enrichment to create the blend-stock (enriched tails material) for the HEU as was contained in the final product. Russia now has greater direct access to the U.S. enrichment market than it did earlier, and the enrichment market in general is well supplied.

Reaction to the Fukushima Accident – The Fukushima accident has already had a major impact on nuclear fuel consumption by causing the shutdown of a number of reactors. Some of these will remain offline permanently, while others will likely slowly come back. More than this, it is hastening the exit of some nuclear power countries and delayed or eliminated the entry of new nuclear countries. The impact, as measured by the change in our current base case demand projection until 2030 compared with our projection before the accident, is roughly 725 million pounds U₃O₈.

Recent developments suggest that things are getting better as China has implemented safety changes (as discussed above) and Japan’s new government is now looking more favorably on nuclear. Also, it does seem that a number of countries are still considering nuclear power, largely unaffected by what happened at Fukushima. However, we still do not know how things will play out, and this uncertainty will overhang the market for some time.

U.S. Government’s Decision to Liquidate Inventories – Another big factor affecting the market has been the U.S. government’s decision to liquidate its uranium inventories by enhancing the sale of its enrichment business in the 1990s, and more recently, paying for work done on cleaning up its retiring enrichment plants. These sales or transfers seem to be done at the most inopportune time, either competing earlier with sales of HEU feed or more recently coming after the Fukushima accident and the associated reduction in demand.

The impact that U.S. government inventory liquidation will have on the market will diminish in the future as inventories held by the government shrink. While the U.S. government still holds a considerable amount of tails material, the economics of this supply to the market is somewhat questionable due to accessibility of the material and the assays involved.

Technology – Another major factor in the market is technology. Enrichment is moving away from gaseous diffusion to centrifuge and possibly a mix of centrifuge and laser technology in the future. The advance of enrichment technology impacts uranium because uranium and enrichment are substitutes, and lower enrichment costs and the ability to enrich economically at lower tails means that there is greater potential for substitution.

However, when it comes to technology and the uranium market, it is not just enrichment technology that is important, but advances in natural gas recovery as are recently occurring. Just as enrichment is a substitute for uranium, natural gas is a substitute for nuclear power, and hence uranium (and enrichment). One way that nuclear power may be able to counteract this trend is through development of new small modular reactor (SMR) technologies. Technology promises to have a larger impact in the future than it has in the past, and thus is worth watching.

Concluding Remarks – As stated at the outset, these game changers impact large quantities of supply or demand. Some of these developments are sustainable and some are not. For instance, HEU feed supplies are going away and U.S. government inventory supplies are limited. In this respect, the ability of governments to affect supplies in the future will likely diminish, although they can still have a large influence with respect to policies on uranium mining, as has been the case in Kazakhstan. However, government policies will clearly have a continued influence on nuclear power's future, as seen with the energy debate now happening in France. As such, governments will continue to have a huge impact on nuclear fuel demand.

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