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The Supply and Demand Fundamentals of Uranium

A Monday Morning Musing from Mickey the Mercenary Geologist

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The uranium spot price has undergone two boom and bust cycles during the past 10 years, both largely driven by increasing demand for nuclear fuel that caused speculation followed by parabolic collapse. The first cycle began in mid-2003 when the spot price climbed above its long-term base of $10/lb to peak at $135/lb in mid-2007 before crashing to $40. This classic rise was largely driven by hedge-fund speculation and the fall was exacerbated by the global economic crisis of 2008-2009.

I became bullish on uranium stocks in late 2008 and made my outlook public in early 2009. Contrarians should be early to the marketplace and the $40/lb spot price base did not break to the upside until mid-2010. By February 2011, spot was over $72. A month later, the 9.0 scale earthquake and 13 meter tsunami in northeastern Japan resulted in the nuclear power plant disaster at Fukushima. The spot price fell precipitously and has not recovered its former levels. Uranium stocks followed suit.

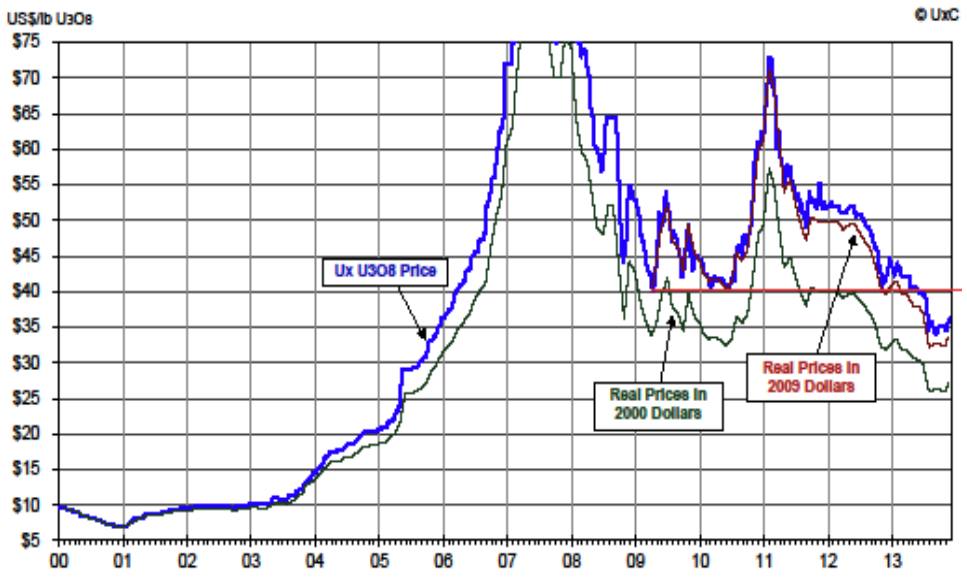
Since then, the worldwide uranium industry has been in a state of flux. Prior to the Fukushima incident, there were 55 operating nuclear power plants in Japan. They accounted for 12% of the world's 443 electricity-producing reactors and an equivalent amount of U_3O_8 demand. Now all of Japan's 50 remaining operable plants are idled, and only 14 have applied for restarts. It is undetermined whether any will produce electricity in 2014.

The uranium spot price that peaked at over $70/lb is now half of that, about $35. This fall in price is largely due to the drop in fuel demand caused by the Japanese government's forced shutdown of all reactors pending safety reviews, mandated modifications, and permits to restart.

With reactors mothballed and no current domestic demand, Japanese power companies have deferred buying of uranium and purchased more expensive alternative sources of energy supplies, especially LNG. Perhaps some have sold stockpiles into the spot market to fund these purchases. Deferral of purchases has lessened immediate demand but has also become a buying opportunity for other large utility companies, sovereign funds, and governments to cover their short-term uranium needs at lower cost.

With depressed prices and short-term utility demand covered, traders and speculators have largely left the market, putting additional downward pressure on the spot price.

The net result is a buyers' market with little short-term demand, small volume trades, and discretionary spot buys.



Uranium Spot Price in Actual, 2000, and 2009 Dollars (Ux Consulting)

Ux Consulting estimates that over 40% of world uranium mine production loses money at the current spot price below $40. However, the spot market is actually a small part of the overall supply of U_3O_8, this year accounting for about 20% of global nuclear fuel demand.

Most uranium supplied to utilities is via long-term off-take contracts with mine producers, governments, reprocessors, and other suppliers. According to Ux Consulting's estimates, the current long-term contract price has fallen from $75 to $50/lb since early 2011, putting it 30% higher than the spot price. Furthermore, most off-take agreements currently in place were negotiated during a time of much higher uranium prices and far exceed the current term price of $50.

The demand scenario that drove uranium prices up over the past decade also has driven production significantly higher, from less than 36,000 tonnes U in 2003 to over 58,000 tonnes U in 2012, a gain of 61%. Nearly 80% of new production over the last10 years has come from Kazakhstan ISR projects, which now supply over 35% of annual mined uranium.

Uranium mine production has not met annual nuclear fuel demand for the past 25 years. Although mine production has been closing this gaping supply deficit, a substantial shortfall still exists between mined uranium and reactor demand

Since 1993, the Russian-USA "Megatons to Megawatts" program has mostly filled that shortfall, supplying about 9000 tonnes of U per year by converting highly-enriched uranium from USSR atomic bombs into low-enriched uranium for nuclear fuel. This uranium has provided 1of 10 Americans with electricity over the past 20 years. However, the last tranche from that agreement was shipped in late November.

Sales from United States Department of Energy uranium stockpiles and other governments' inventories and increasing contributions from recycling and reprocessing facilities have also delivered significant amounts of fuel to meet reactor demand.

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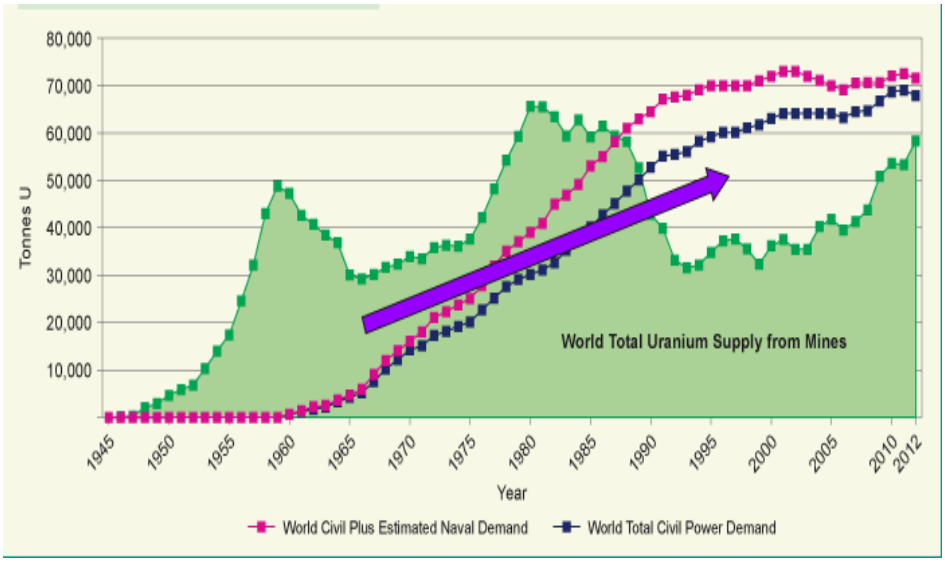

World Uranium Production and Demand (World Nuclear Association)

Speculation on the lowering of demand elsewhere in the world since Fukushima has also affected market prices. But this fact remains: The world's nuclear power build-out continues unabated, especially in emerging market countries. Worldwide, there are 71 reactors currently under construction, 173 on order or planned, and 314 proposed. For reference, these numbers are up from 62 and 156, and slightly down from 322 in February 2011.

With the complete shutdown of Japan's nuclear energy fleet, 11% of the world's electricity is now produced from nuclear power, down from about 14% pre-Fukushima. No matter what the Japanese ultimately decide with respect to nuclear power, new reactors under construction will undoubtedly turn that decline around in the mid-term.

With uranium prices well below the breakeven point for many producers and little short-term demand, current mines are shutting down or cutting back, and new mines and developments are being postponed or cancelled. The net result is primary production will likely drop significantly in 2014 and even more so in 2015. When combined with the removal of about 13% of world supply from the HEU-LEU program, the mid- to long-term supply of uranium is in jeopardy of not meeting reactor demand.

Any new mine developments in market economy countries require higher prices to be profitable and therefore, to be developed. There is considerable skepticism in the industry that Kazakhstan can continue to maintain production levels. Its easily-developed ISR fields are maturing and decline curves are setting in. New developments are going after deeper deposits with uranium that is technically more difficult and costlier to recover.

Therefore, the problem will become the solution at some point, as the cure for low prices is low prices. Supply and demand fundamentals control price and uranium fundamentals look bullish to me for the mid- to long-term.

In my opinion, now is a good time to find some uranium stocks on sale.

Ciao for now,

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Acknowledgement: I thank Amir Adnani for continuing discussions regarding the uranium market.

The **Mercenary Geologist Michael S. "Mickey" Fulp** is a Certified Professional Geologist with a B.Sc. Earth Sciences with honor from the University of Tulsa, and M.Sc. Geology from the University of New Mexico. Mickey has 35 years experience as an exploration geologist and analyst searching for economic deposits of base and precious metals, industrial minerals, uranium, coal, oil and gas, and water in North and South America, Europe, and Asia.

Mickey worked for junior explorers, major mining companies, private companies, and investors as a consulting economic geologist for over 20 years, specializing in geological mapping, property evaluation, and business development. In addition to Mickey's professional credentials and experience, he is high-altitude proficient, and is bilingual in English and Spanish. From 2003 to 2006, he made four outcrop ore discoveries in Peru, Nevada, Chile, and British Columbia.

Mickey is well-known and highly respected throughout the mining and exploration community due to his ongoing work as an analyst, writer, and speaker.

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