FBP Update
Impacts Of DOE Uranium Barter Program On U.S. Domestic Industry

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FBP advocates full appropriation funding for Portsmouth D&D; but continued DOE UF6 uranium barter sales if appropriations are not forthcoming

- In FBP’s analysis based on objective measures to date conclude that the U.S. uranium mining, conversion and enrichment industries have not experienced an adverse material impact from DOE’s Uranium Barter Program......
  - Uranium Market Prices (Long Term & Spot)
  - Domestic Uranium Production
  - Domestic Employment

- DOE has implemented a Transparent and Predictable Plan

- FBP has followed through and provided DOE with a model (Traxys) designed to sell the material in a market neutral non-disruptive manner—moving material from the spot to long-term market and domestic to international.
DOE Barter Sales (FBP-Traxys Model)

- DOE quantities are minor compared to other sources
- Sales methodology to minimize impact on uranium market
- Preference to sell to end users rather than speculative players to prevent material from competing against itself.
- 50% of sales to U.S. utilities / 50% to non-U.S. utilities
- 50% of sales under mid and LT contracts, spot quantities very minimal
- U3O8 and Conversion have sometimes been contracted separately
The DOE U barter program has not had an adverse material impact on domestic industries as shown by...

1. As reported by EIA, the **price** paid for U.S. origin uranium over the past 20 years has been at its highest in the last 5 years, since the barter program started.

2. US uranium **production** has been increasing since the beginning of the barter program, and is at its highest level now since 1997 (EIA Data).

3. US uranium **employment** has grown (2009-2012) since start of barters.

4. US uranium producers **Market Cap** has increased significantly over time, with many approaching pre-Fukushima highs over the last 3 months.

5. US producer Capital Expenditure decisions are made based on **long-term U3O8 prices**, not spot prices. U3O8 Term price is $50/lb.—up from the decades before level of $10/lb.

6. Term & spot **UF6 conversion prices** are up 40% to 45% since barters began.
Since the start of uranium barters, domestic production has increased to highest level since 1997 and is likely to continue to increase in 2014.
Since the start of uranium barter programs, employment has increased. Recent layoffs in 2013 are partially offset by the startup of 2 new domestic ISL producers in 2013 and 2014.

Source: Energy Information Agency Domestic Uranium Production Reports for 2013 and 2004
Prices rose quickly, over-stimulated by an excess of exuberance, not fundamentals. A correction was inevitable. 90% of the price drop occurred prior to start of barter program.

Highest U.S. Origin prices have been in the last 6 years—Over 5X the decade of 1994-2004. Average price for the latest reported year (2013) is $56.37/lb. U3O8

Market Insights

• The 2007 bubble prices over stimulated supply and the imbalance was accentuated by a large, near-term loss of demand due to Fukushima.

• In response primary production needs to be reduced, yet it has continued to expand.

• Most expansion is by the world’s largest suppliers, some of whom have expanded in other countries (Kazakhstan and Canada) while cutting back in the United States.

• Current market prices are well off their 2007 peak but still significantly higher than the pre-spike decade, by 3X—5X.
Principal Contributions to Price Decline

- Reduction in near-term demand of 25 million lbs./year due to Fukushima
- Annual primary production increased 50 million lbs. (50%) from 2007 to 2012 – Kazakhstan accounted for more than 41 million of this increase
- Properties currently under development are projected to increase production by another 40 million lbs. (25% increase) through 2018
- Increase in excess enrichment supply (partially due to Fukushima) encourages additional “production” of about 13.3 million lbs. equivalent per year from under-feeding/re-enriching tails
- Low cost financing (Stimulus derived) available to banks resulted in significant quantities of excess near-term uranium being offered at low, fixed prices to be held for future delivery at imputed interest rates ~3%
- Above factors are partially offset by end of feed from Russian HEU Deal
U₃O₈ Supply/Demand Changes Since Peak Price Year—2007

DOE Barter quantities are very small compared to other changes
Expansions based on April 15, 2013 Central Asia Economy article discussing Kazatomprom plans.
FSU Equivalent U₃O₈ Production Market Share is 65% in 2013—if HEU and Underfeeding were included...
2013 Worldwide $\text{U}_3\text{O}_8$ Production

Total = 155.8 million lbs (59,500 MTU)

Kazakhstan 37.6%

Uzbekistan 4.2%

Russia 5.9%

Namibia 7.3%

Australia 10.6%

Canada 15.6%

China 2.5%

Ukraine 1.5%

South Africa 0.9%

Others 4.0%

Kazakh market share continues to grow
U₃O₈ Industry Supply Concentration Ratios (after ARMZ/Uranium One Merger, including Russian Underfeeding)

- Percentage of Primary Production Owned in 1989
- Percentage of Estimated Primary Production Owned in 2012

Supply is concentrated in a small number of suppliers.
Redacted

Supply through 2020 far exceeds needs – Building Strategic Inventory
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Redacted
Issues FBP Considered to reach our Recommendation of Continued Uranium Barters

1. **History vs Future**: 2, 5 and 20 Years (1993 – 2033)
2. **U.S. vs International**: market demand and currency devaluations
3. **Total vs Uncommitted**: (Supply and Demand) for clearing price projections
4. **Primary Supply vs Secondary Supply**: DOE relative shares and dev. projects
5. **US Nuclear Interests vs Market Segment Interests**: U.S. Fleet, D&D, etc.
6. **Bubbles**: Inventory, Price, Supply and China: impacts
7. **Economic ($) vs Control (Market Share)**: Western companies vs FSU economies
8. **Enrichment vs U3O8/UF6**: DOE excess forms vs % of total market supply
9. **GDEP D&D Fees vs U Barter Sales vs Appropriations**: Levelized DOE Plans
10. **Timing of obsolete infrastructure**: DOE has to avail use of HEU and X-344
11. **Stakeholders**: US Citizens, Regulators, fleet, D&D, fuel cycle companies
North American Conversion Prices

- Spot price changes show no correlation to barter sales.
- Term & spot prices up 40% to 45% since barters began.
- Term prices not very volatile, generally up since barter started.
Conversion Market Observations

• Some excess supply through 2018 even with expected shutdown of Springfields on August 31, 2014 (2 Years Early)

• Excess
  – Mainly due to underfeeding
  – Barter quantities are small about 4% of demand, about 25% of HEU feed which ended in 2013

• Some expansion could be necessary beginning late this decade if China does not reach its goal of self sufficiency
Impact on Domestic Converter

• Appears that their policy is to sell on term market

• Term & spot prices are up 40% to 45% since barters began; therefore there can be no price impact

• Resumed production in mid-2013 after year long shutdown for NRC licensing related upgrades

• Operating at near capacity; therefore no current production or employment impact