

The background features a large, light gray spiral composed of many small spheres, creating a sense of depth and movement. The spheres are arranged in concentric circles that spiral inward from the top left towards the center.

WNA 2006 Annual Symposium
Fueling the Future: An Update



Jeff Combs, President

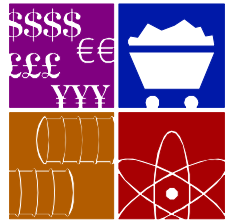
September 9, 2006

The Ux Consulting Company, LLC

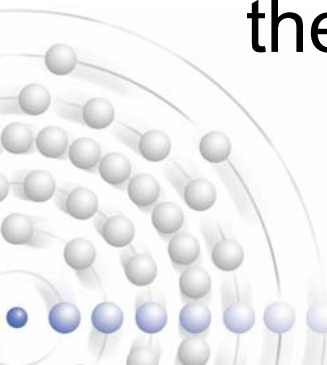
Roswell, Georgia

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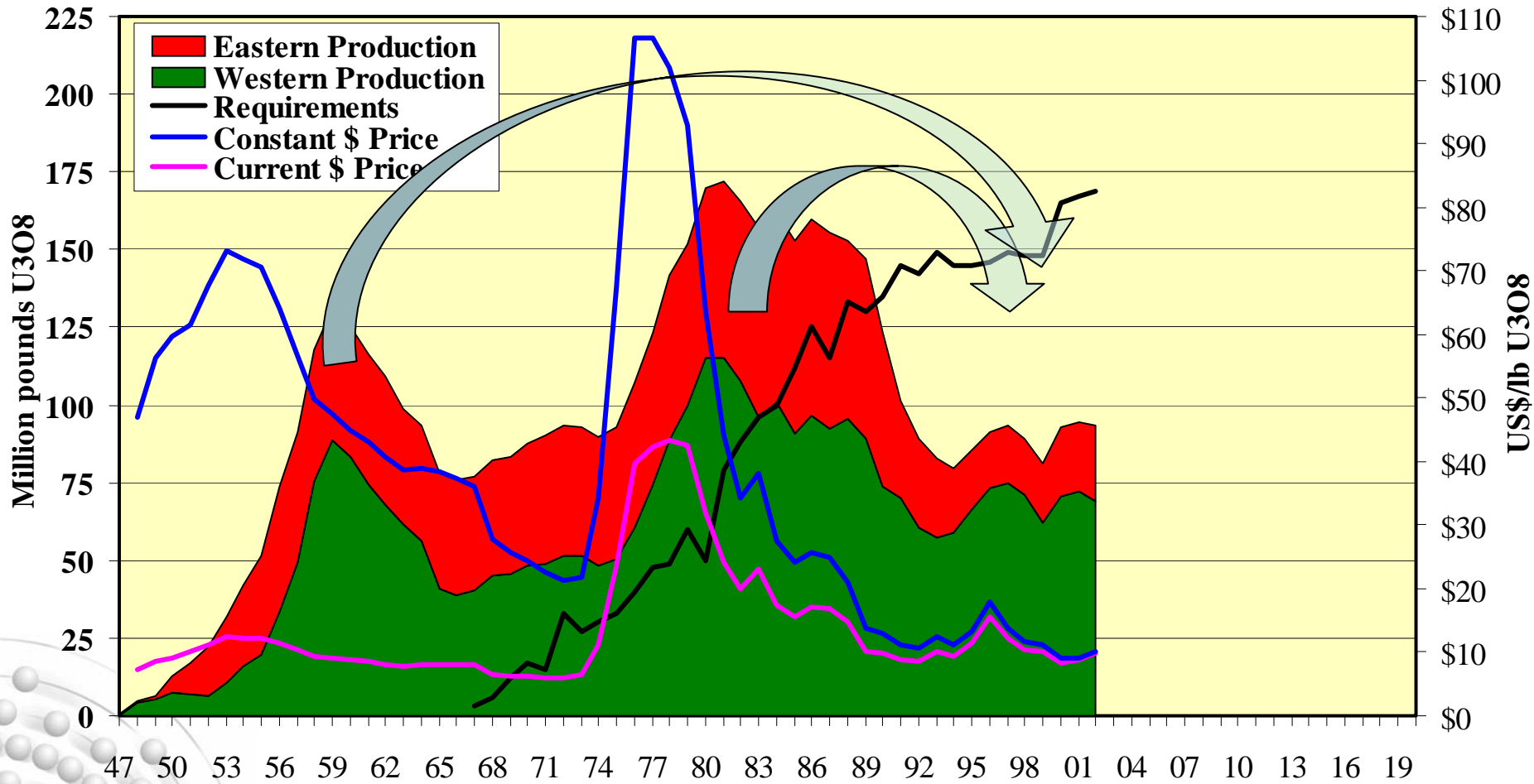
2004 Paper



- ▶ **Fueling the Future: A New Paradigm - Assuring Nuclear Fuel Supplies in an Abnormal Market**
 - Given Its Unusual Evolution, Would the Market Be Able to Generate Sufficient Supplies to Support the Growth in Nuclear Power?
 - **Market Failure** - If Sufficient Supplies Are Not Available in a Timely and Price-Efficient Basis the Market Can Be Considered to Have Failed

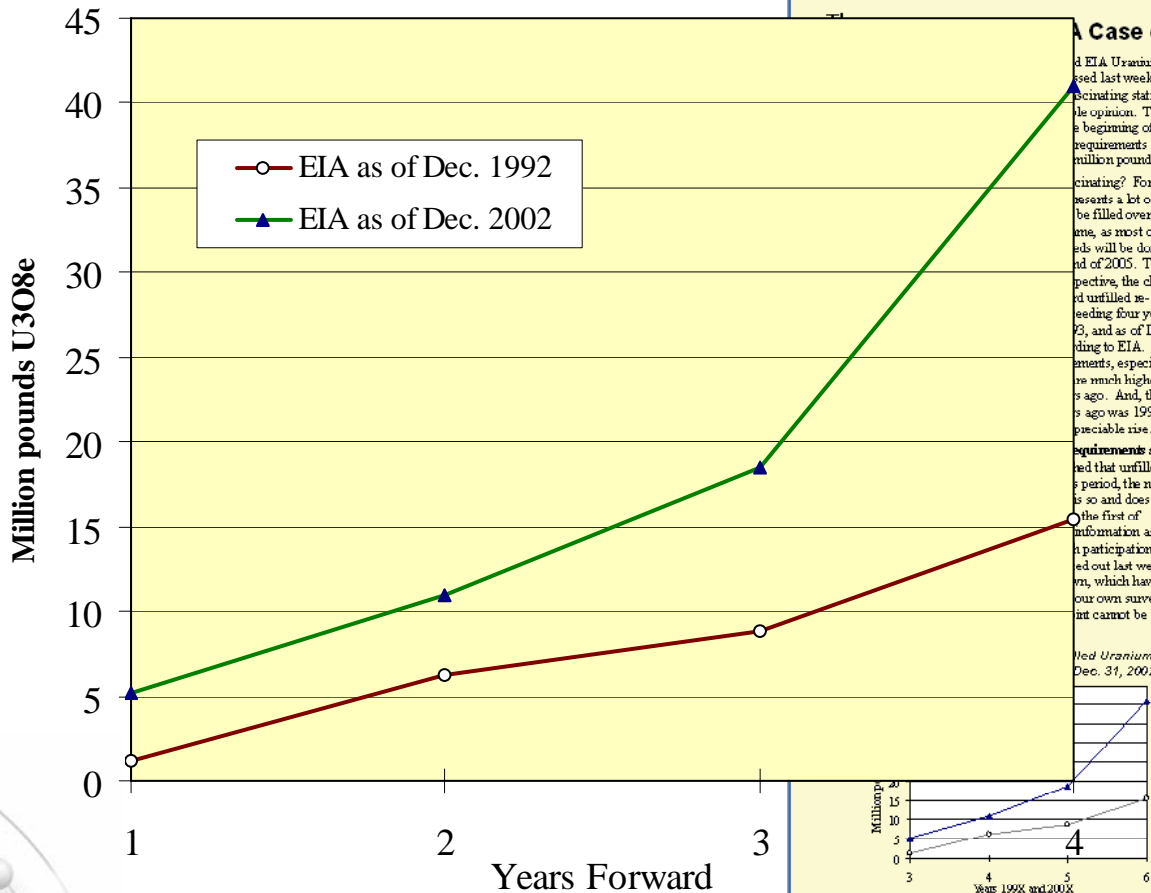


World Production vs. Requirements, 1947-2002



The Ux Weekly

June 9, 2003



A Case of Market Failure?

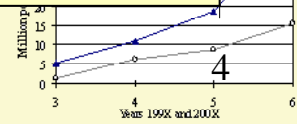
...EIA Uranium (used last week) ...curating statisti- ...le opinion. The ...e beginning of ...requirements for ...million pounds. ...cinating? Forty- ...resents a lot of ...be filled over a ...ne, as most of ...eds will be done ...nd of 2005. To ...pective, the chart ...d unfilled re- ...eeding four years ...23, and as of De- ...ding to EIA. ...ments, especially ...e much higher ...s ago. And, the ...s ago was 1996, ...preciable rise. ...requirements so ...ed that unfilled ...s period, the next ...s and does it ...the first of ...information as ...participation is ...ed out last week, ...m, which have ...our own survey. ...nt cannot be

One reason that unfilled requirements are higher in this latter 4-year period is because U.S. requirements in general are higher. Requirements appear to be particularly high in 2006 – over 60 million pounds. However, it should be noted that unfilled requirements are also 41 million pounds in 2007, when total requirements are more on the order of 55 million pounds. The way the recent trend is going, U.S. requirements should be in the 55-60 million range, or even higher, during the second part of this decade. Thus, while requirements may be somewhat higher in 2006, this does little to explain why unfilled requirements are so high in that particular year.

Other explanations are that utilities are complacent and/or have been preoccupied with covering their enrichment needs. Historically, we have observed that utilities tend to address their SWU needs before their uranium needs. This is understandable because SWU is a more expensive component, and it is especially understandable in the recent climate where SWU supply choices were limited due to the imposition of duties stemming from the trade case. Thus, it is possible to make an argument that uranium procurement has suffered somewhat due to the attention that was placed on enrichment contracting.

A more compelling reason why unfilled requirements are so high in 2006 is that the market is quite different in 2006 than it is today. Producers are seeking higher prices, and utilities are reluctant to commit at prices that are much higher than today's. As a consequence little long-term contracting gets done and unfilled requirements stay high. It appears that this market change takes place between 2005 and 2006, when unfilled requirements more than double.

Has the market failed? We now come to the question of whether unusually high unfilled requirements out three years are of any importance. If the unfilled requirements are much higher than they should be and if this situation results in a steep price rise, then we would argue that the market has somehow failed. Market failure does not necessarily mean that you run out of supply (although this would represent an extreme case of market failure), but that the market inefficiently allocates goods and services. For example, if production remained flat for five years and all of the sudden had to increase by 30 percent in one year, this wouldn't be an



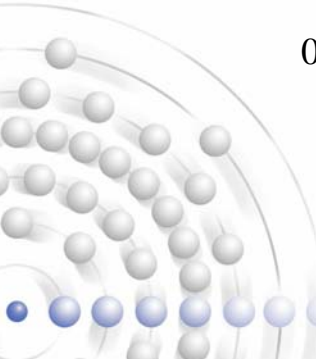
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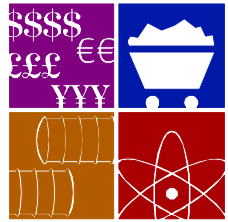
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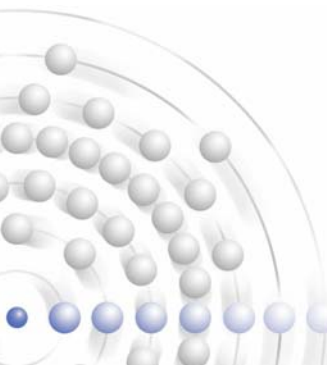
Fueling the Future: An Update



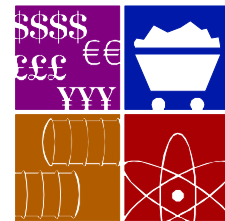
▶ Situation Then and Now

- Nuclear Growth Prospects
- Uranium Prices and Market Issues
- Uranium Production
- Enrichment Prices
- Enrichment Production
- Government Involvement

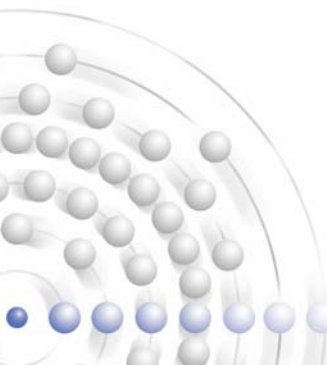
▶ Market Report Card



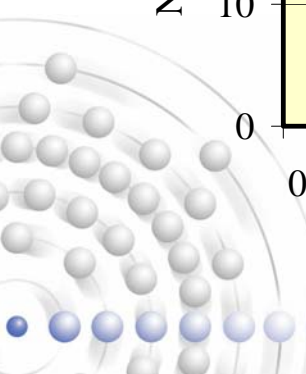
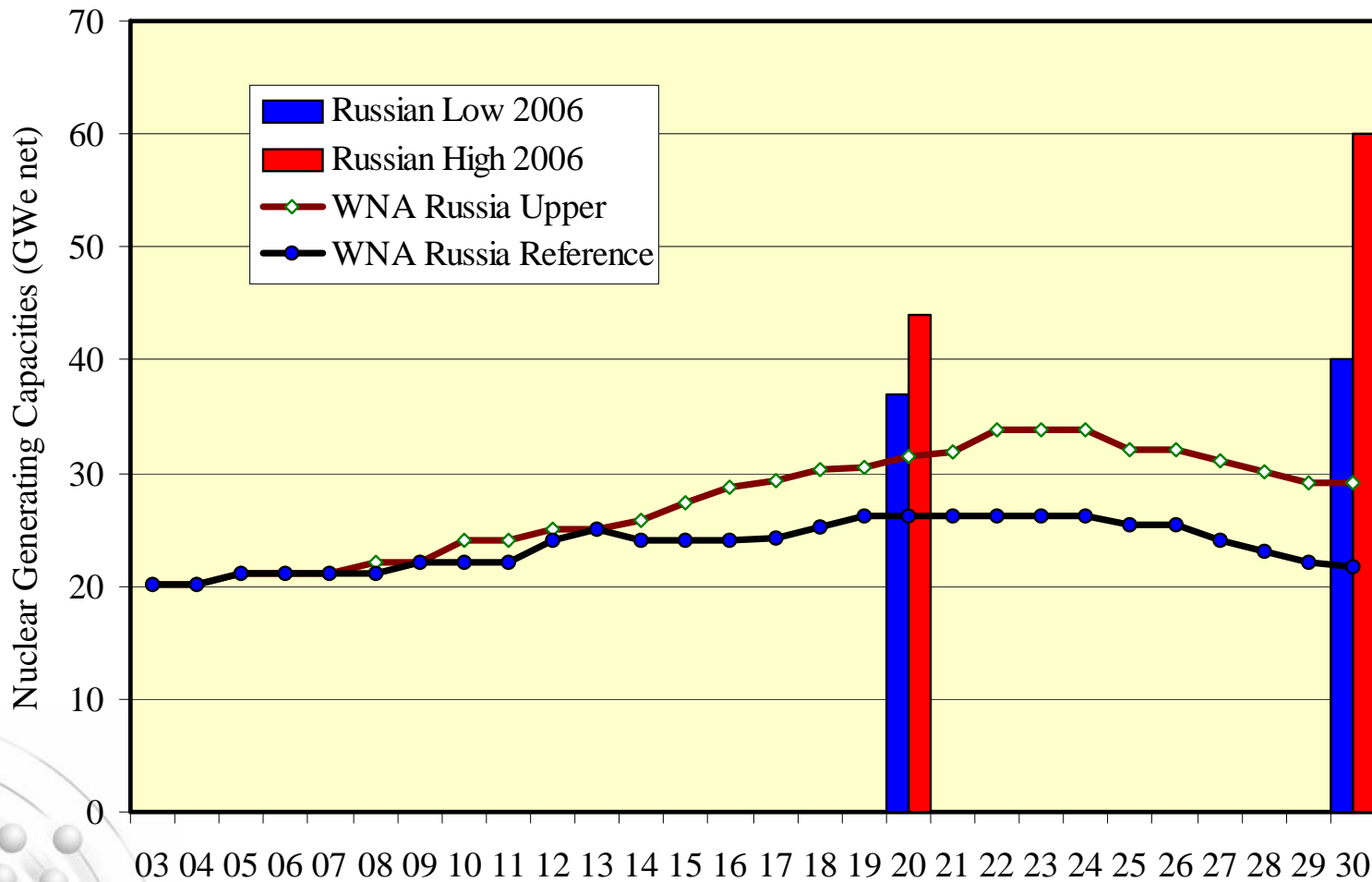
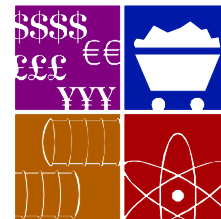
Fueling the Future



- ▶ **Implicit Assumption in Title Was That Nuclear Power Represented an Important Energy Source for the Future**
- ▶ **Expansion Prospects and Plans Have Only Grown Since 2004**
 - Especially in the “East”

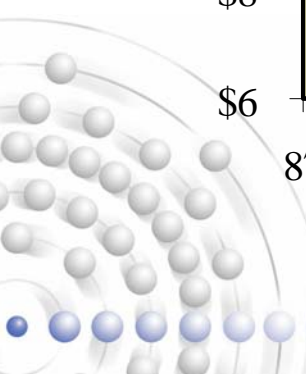
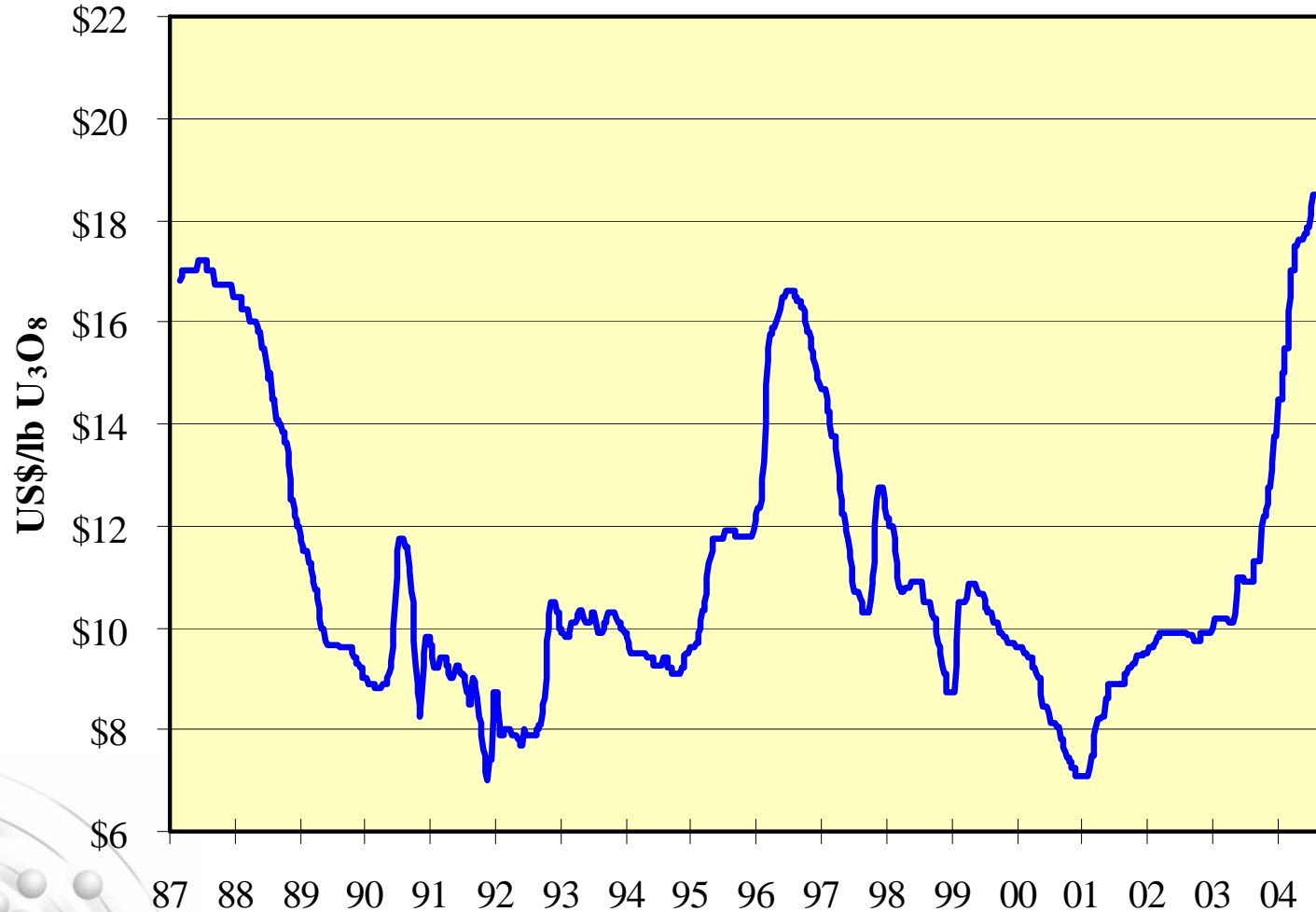


WNA Forecasts vs. 2006 Russian Plans

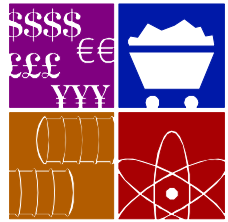




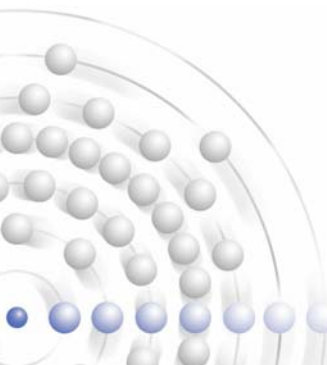
Ux U₃O₈ Prices, 1987-9/2004



Market Theories in 2004



- ▶ **Market Would Repeat ‘96 Spike Scenario**
- ▶ **“Perfect Storm”**
- ▶ **Enrichment Saves the Day**
 - From Uranium Gap to SWU Gap
- ▶ **Market Failure**
 - Time to Buy Uranium Under Base-Escalated Contracts



The Ux Weekly

May 10, 2004




\$16 or \$60?

...Let's say, aside from its alliterative aspect, \$60 represents an extremely high price that is largely divorced from production cost realities, much the way \$6 was on the other extreme.

**Ux U₃O₈ Price
\$17.75**

The



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\$16 or \$60?

In September 1998 we wrote a cover story entitled "\$6 or \$16," that asked the question about the future level of spot uranium prices at a time the current spot price was \$10.20. This followed a July 1998 analysis in our Uranium Market Outlook report that projected the spot price could go as low as \$6 under certain circumstances due to the large inventory supplies that were forecasted to come from HEU feed and USEC sales. To be fair and balanced, we also wanted to examine factors that could push price higher, setting five years as the time horizon for this forward look.

As we know, the spot price did go as low as \$7.10 under the weight of these inventories and other supplies. And, the \$16 level may have looked infeasible at the time we wrote the report and certainly when the spot price crashed, it took only slightly longer than five years – five years and five months to be exact – until price hit this low. So the question is not as absurd as it once was.

At the \$16 level was certainly not the case. One of the reasons for the price increase was certainly the supply shocks last year that we covered earlier, that cover did not support a \$16 price. One of the reasons for the price increase was certainly the supply shocks last year that we covered earlier, that cover did not support a \$16 price. One of the reasons for the price increase was certainly the supply shocks last year that we covered earlier, that cover did not support a \$16 price.

With these two cover stories, we have identified prices falling in a range of \$6 to \$60, or a situation where price differs by a factor of ten. It is important to note that it is only possible to discuss such a wide range in prices because the supply of uranium is assumed to be extremely inelastic (coupled with the fact that demand is inelastic as well), as discussed in last week's cover. Price was pushed down to such a low level because a relatively large share of supply was being sold largely irrespective of the price level. Price can go to very high levels for precisely the same reason. The operative word here is "can." Will it? We'll check back in five years.

Ux U₃O₈ Price

\$17.75

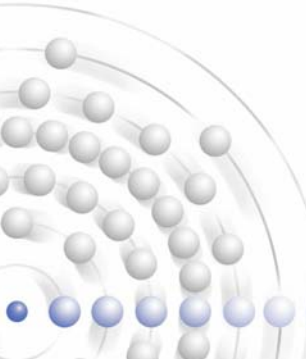
\$17.75

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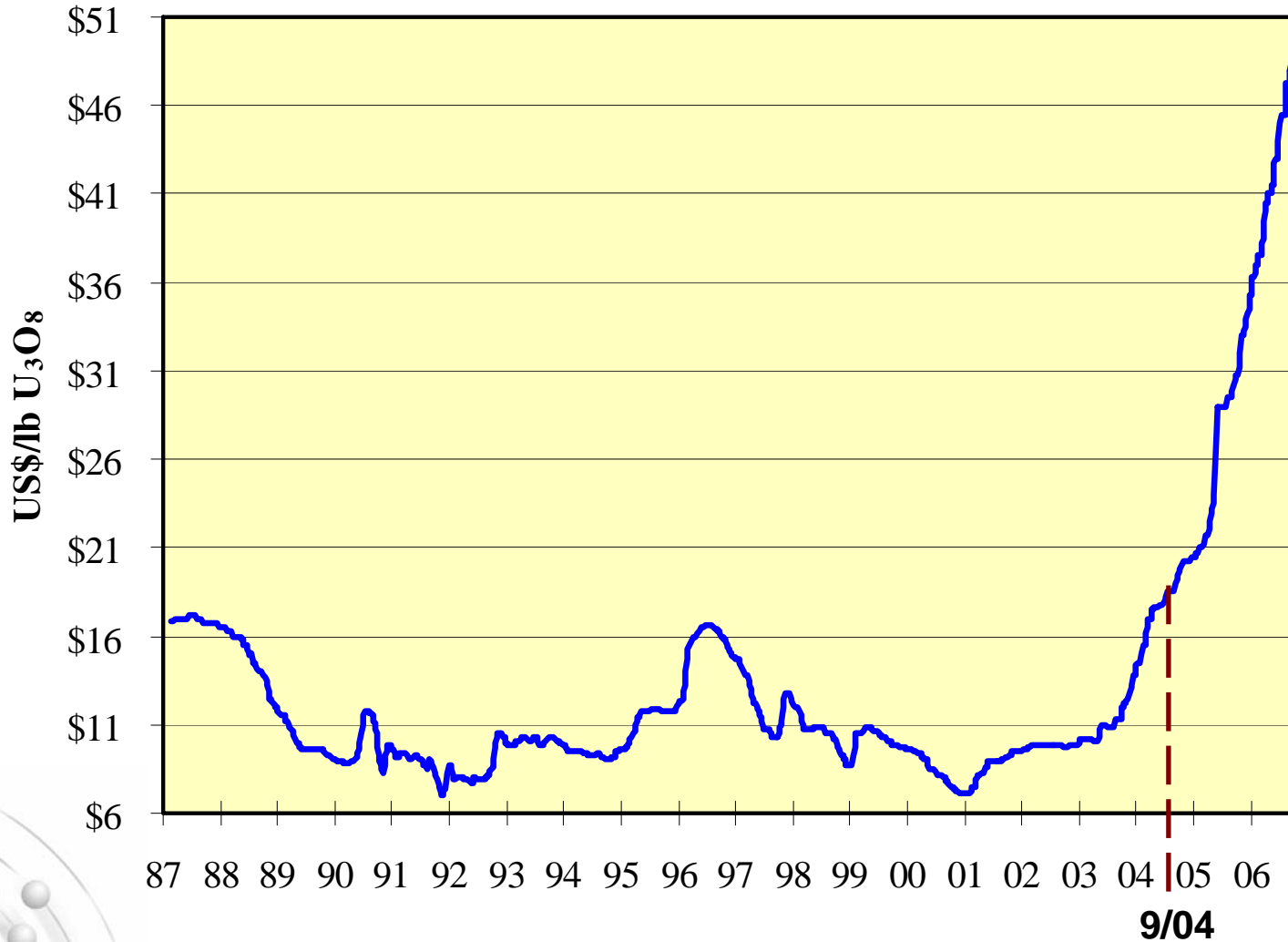
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Price



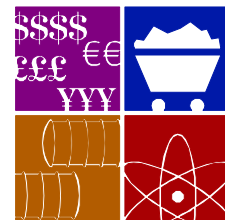


Ux U₃O₈ Prices, 1987-2006



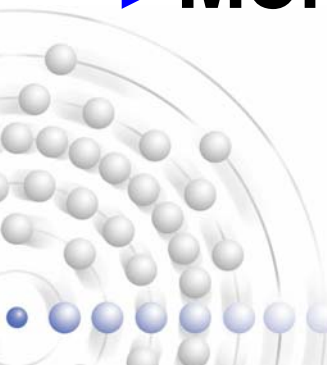
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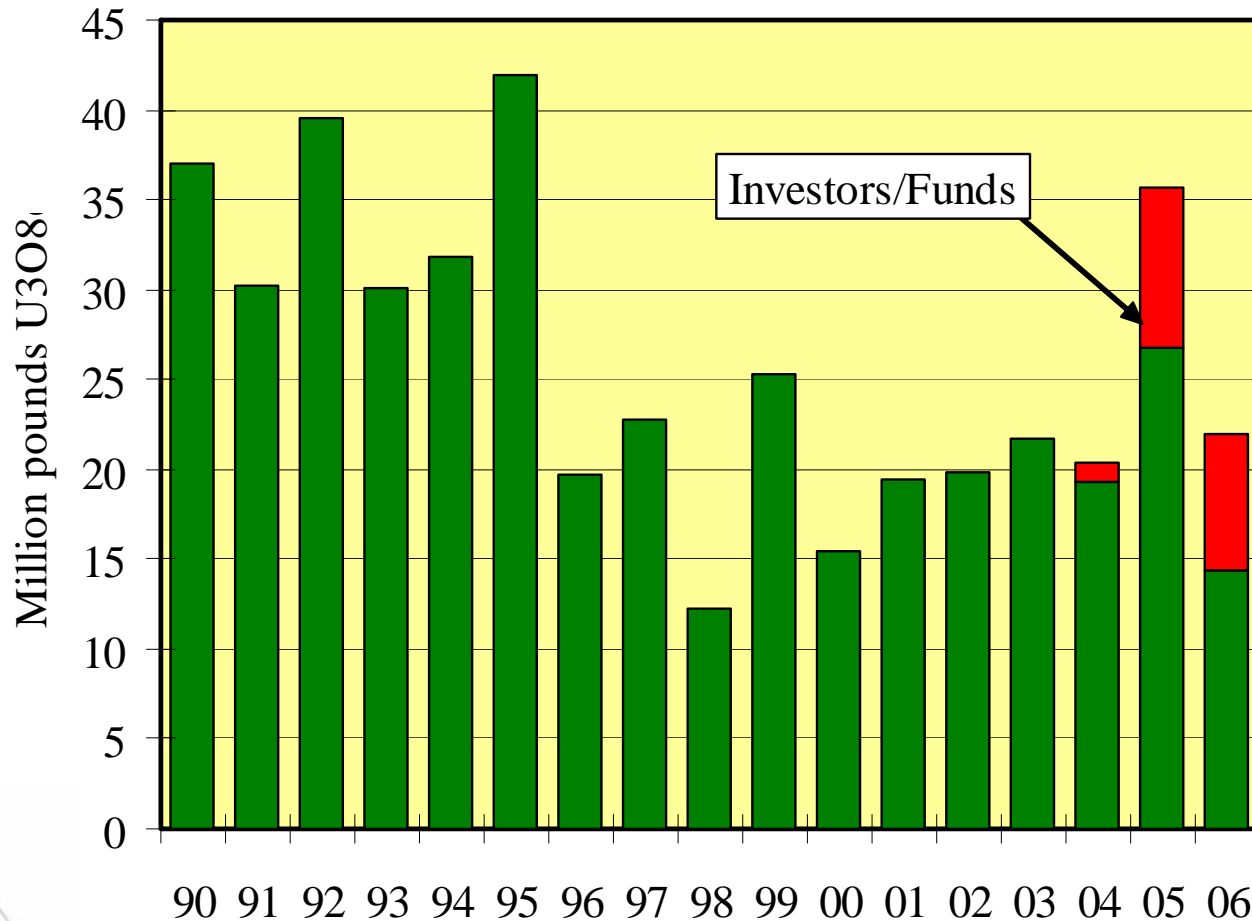
Uranium Market Since 2004

- ▶ **First Cores/More Reactor Growth**
- ▶ **Inventory Building**
- ▶ **Hedge/Investment Fund Buying**
- ▶ **Long-Term Contracting Surge**
- ▶ **Plans to Expand Production**
 - Especially in Kazakhstan
- ▶ **More Production Problems**



U₃O₈ Spot Volumes, 1990-2006

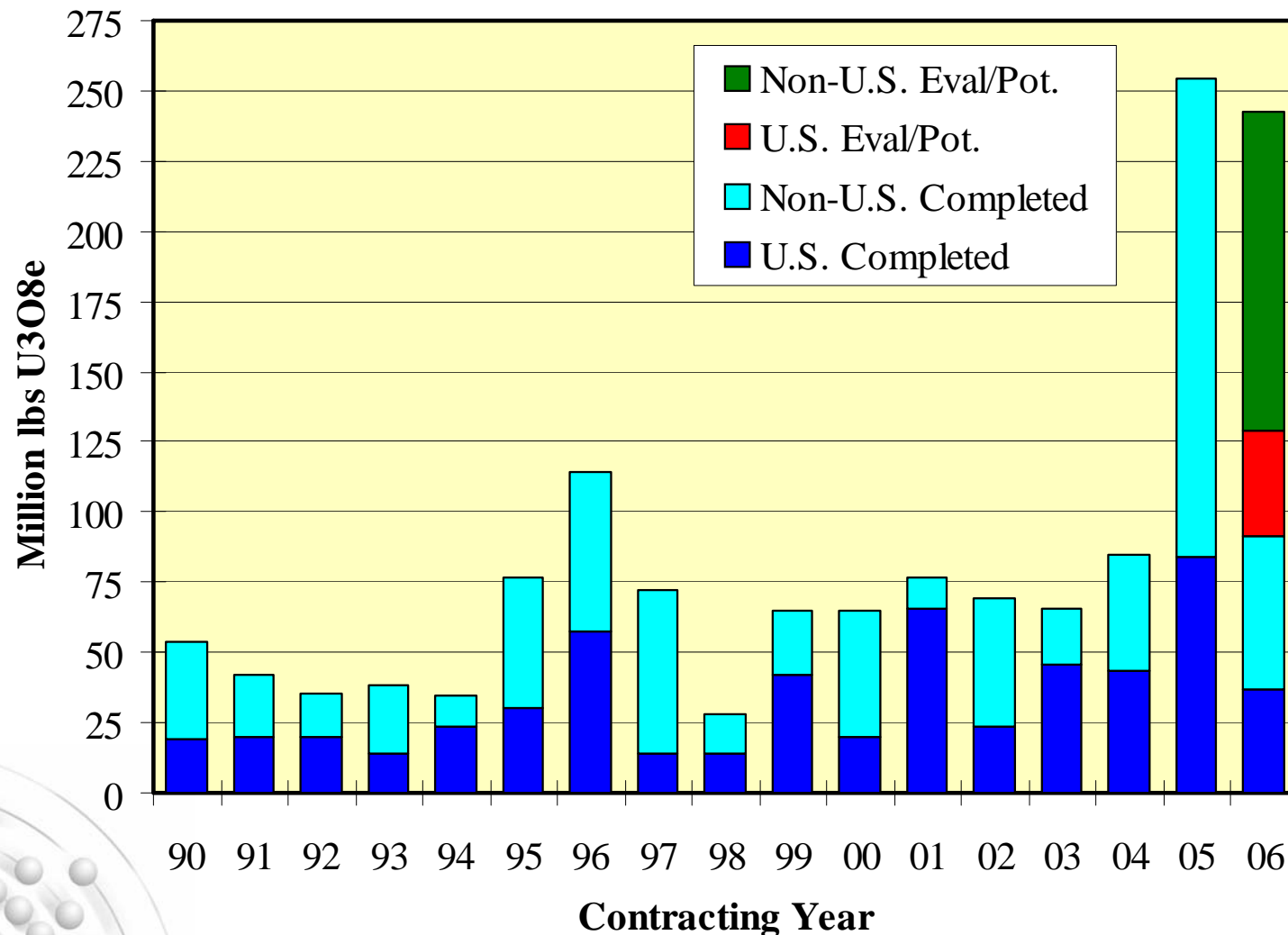
Investor/Hedge Funds Identified



Source: *Uranium Market Outlook*, July 2006



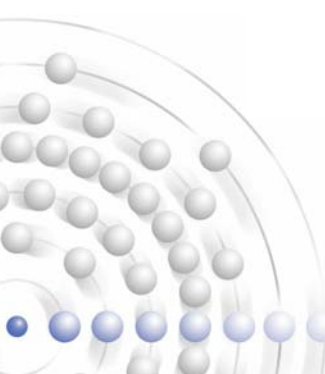
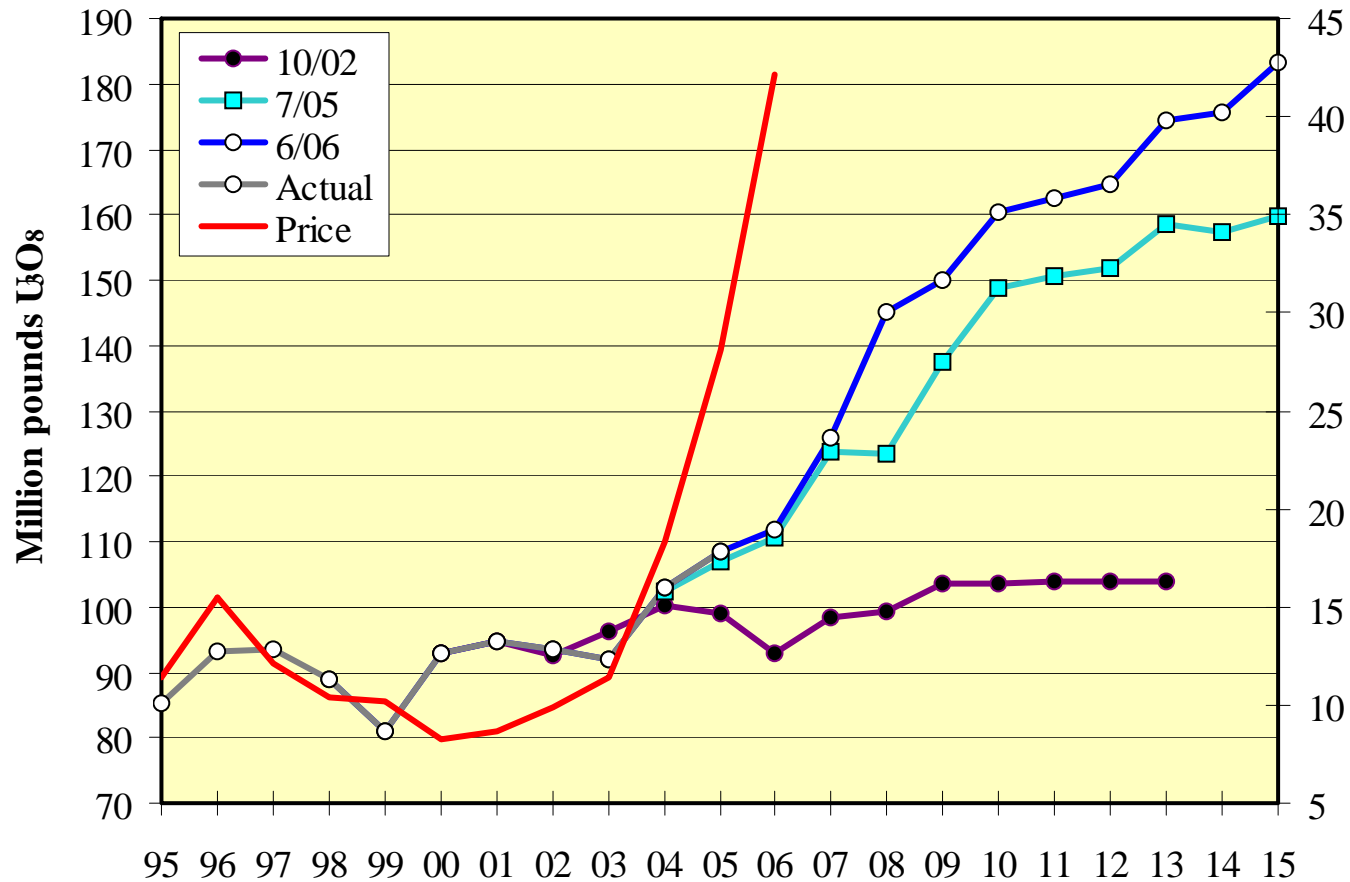
Utility LT U₃O₈ Contract Volume 1990-2005



Source: *Uranium Market Outlook*, July 2006



Changes in U Production Plans



Mid-Year U Production Shortfalls

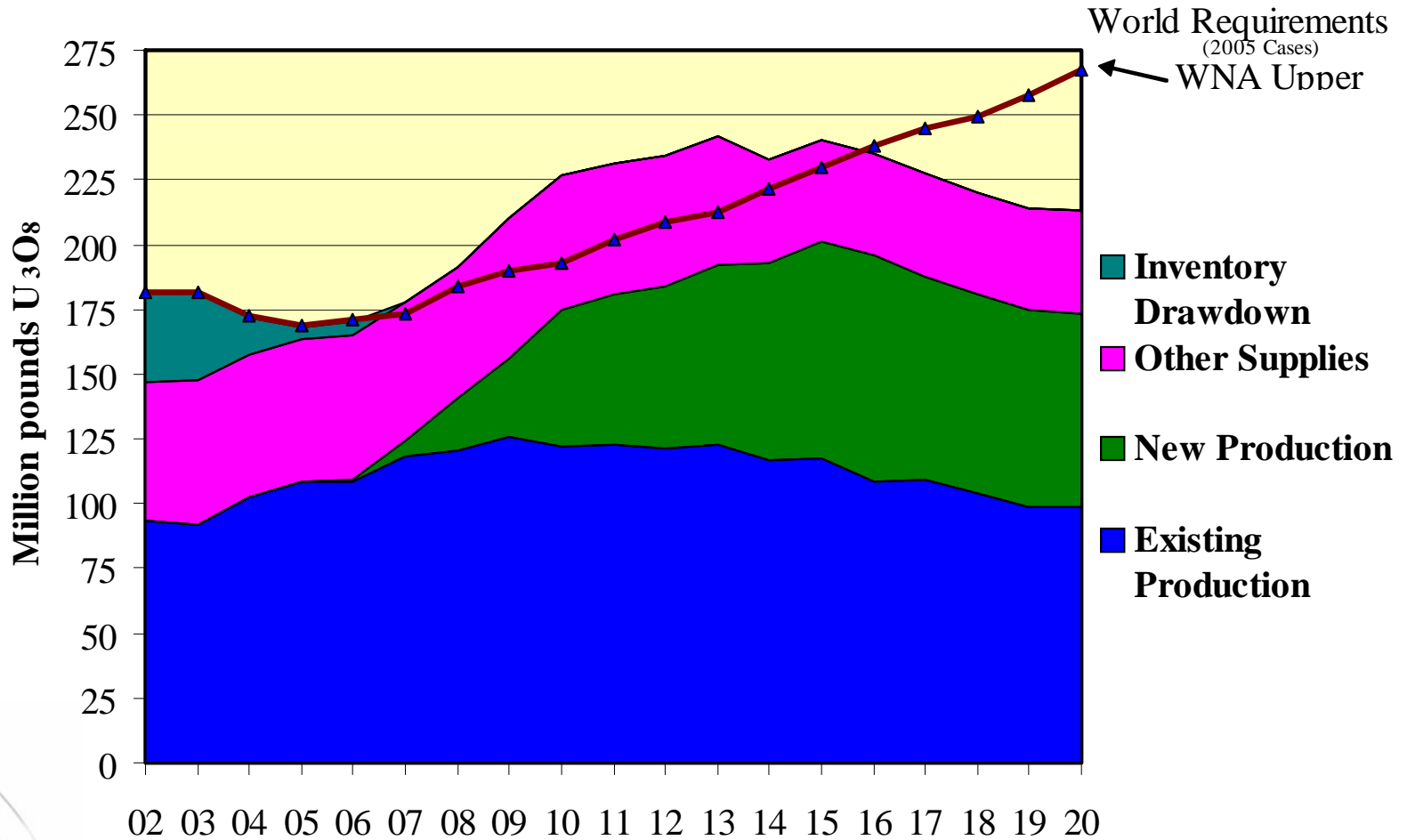


(million pounds U₃O₈)

Project	Actual Production	Mid-year Target	6-Month Deficit
McArthur River	8.85	9.35	-0.50
Rabbit Lake	2.60	2.95	-0.35
McClellan Lake	0.66	2.00	-1.34
Ranger	4.83	6.50	-2.12
Olympic Dam	3.88	5.00	-1.12
Rössing	3.83	4.00	-0.17

Initial 2006 production target was 113 million pounds. Estimated 2006 production now revised to 109 million pounds.

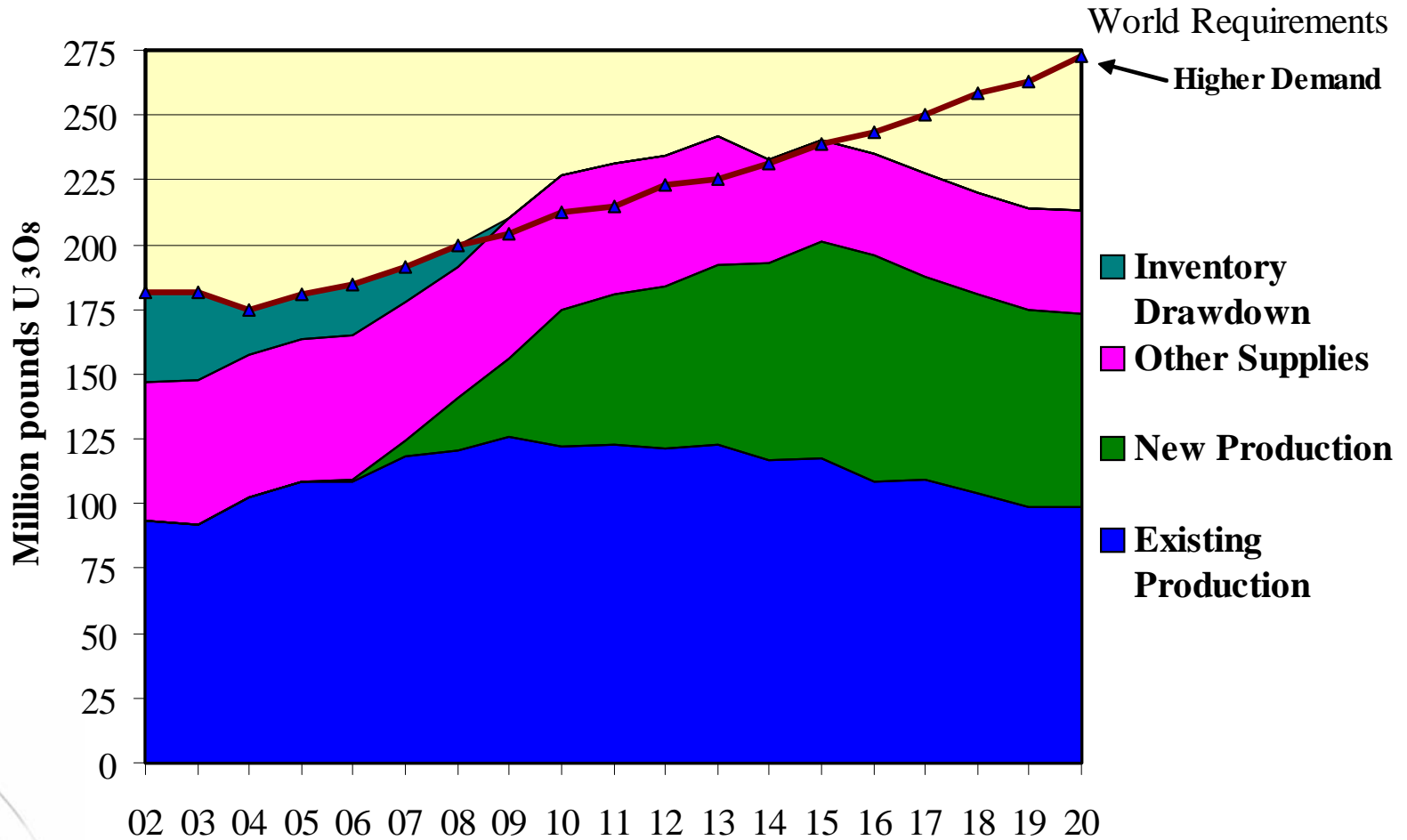
World Supply/Demand Balance – High Production Case



Source: WNA & UxC



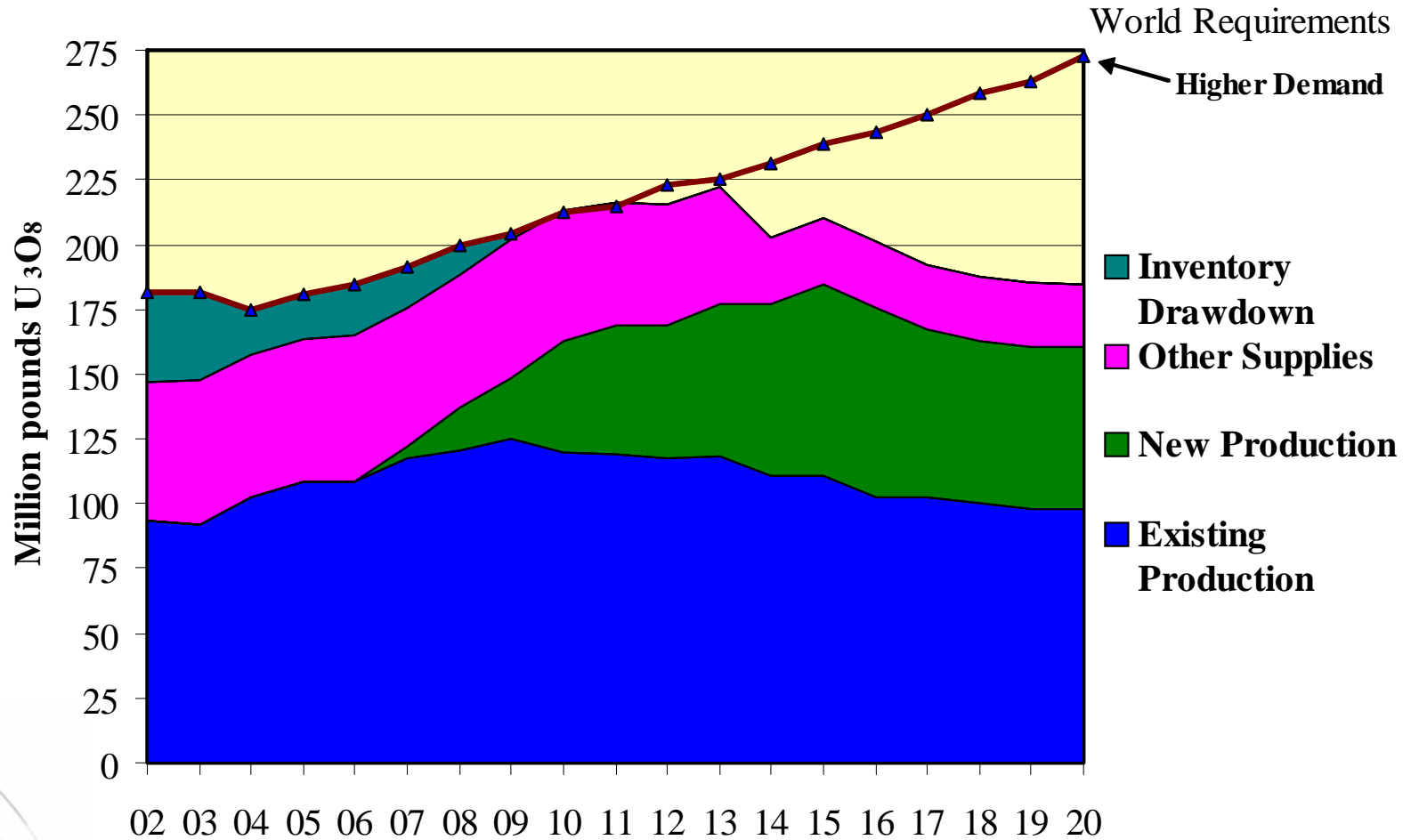
World Supply/Demand Balance – High Production/Higher Demand



Source: WNA & UxC

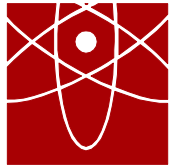


World Supply/Demand Balance – Mid Production/Higher Demand



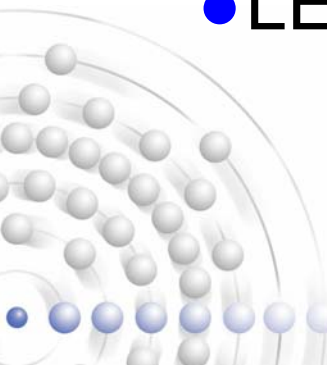
Source: *Uranium Market Outlook*, July 2006

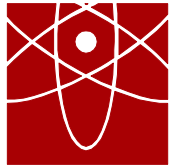




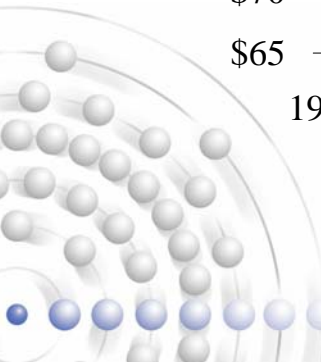
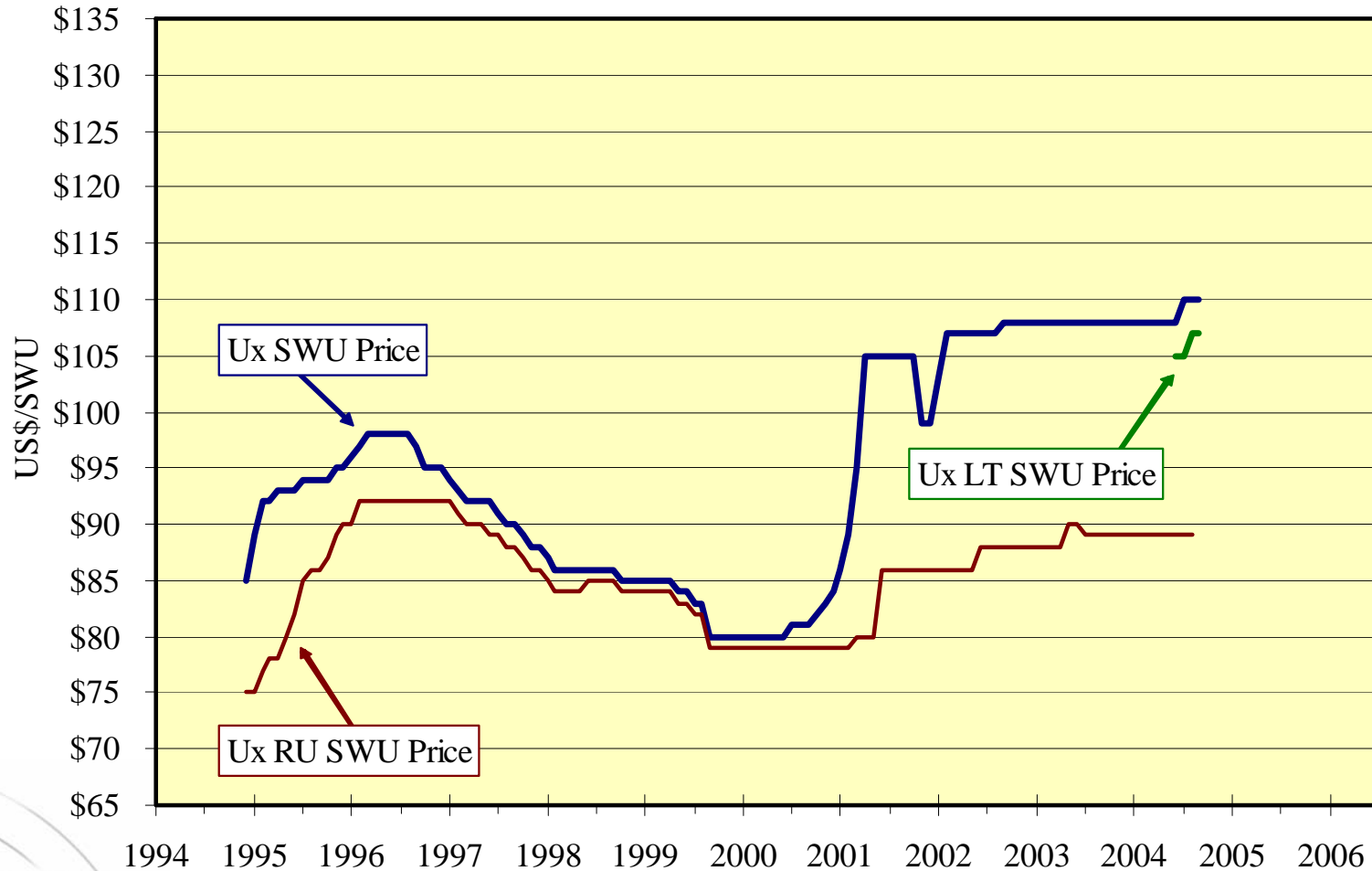
SWU Market Since 2004

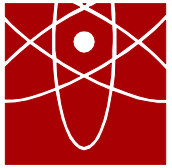
- ▶ **First Cores/More Reactor Growth**
- ▶ **Prices Under Upward Pressure**
 - Supply and Demand in Tight Balance
 - Limited Ability to Substitute for Uranium
 - Electricity Prices Increase Substantially
 - Trade Restrictions Still in Place
- ▶ **Progress on New Enrichment Plants**
 - LES Groundbreaking



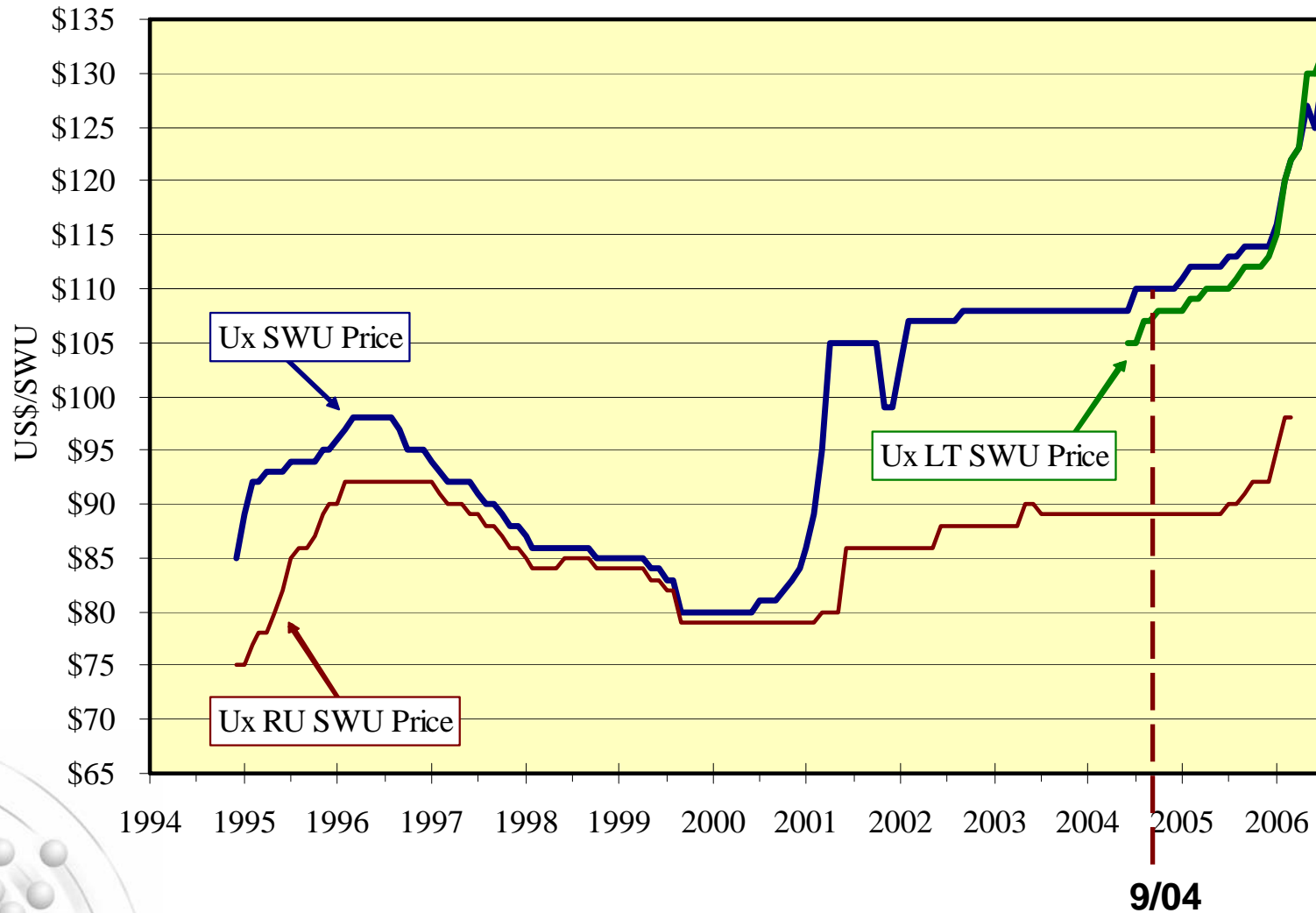


Ux SWU Prices, 1994-2004





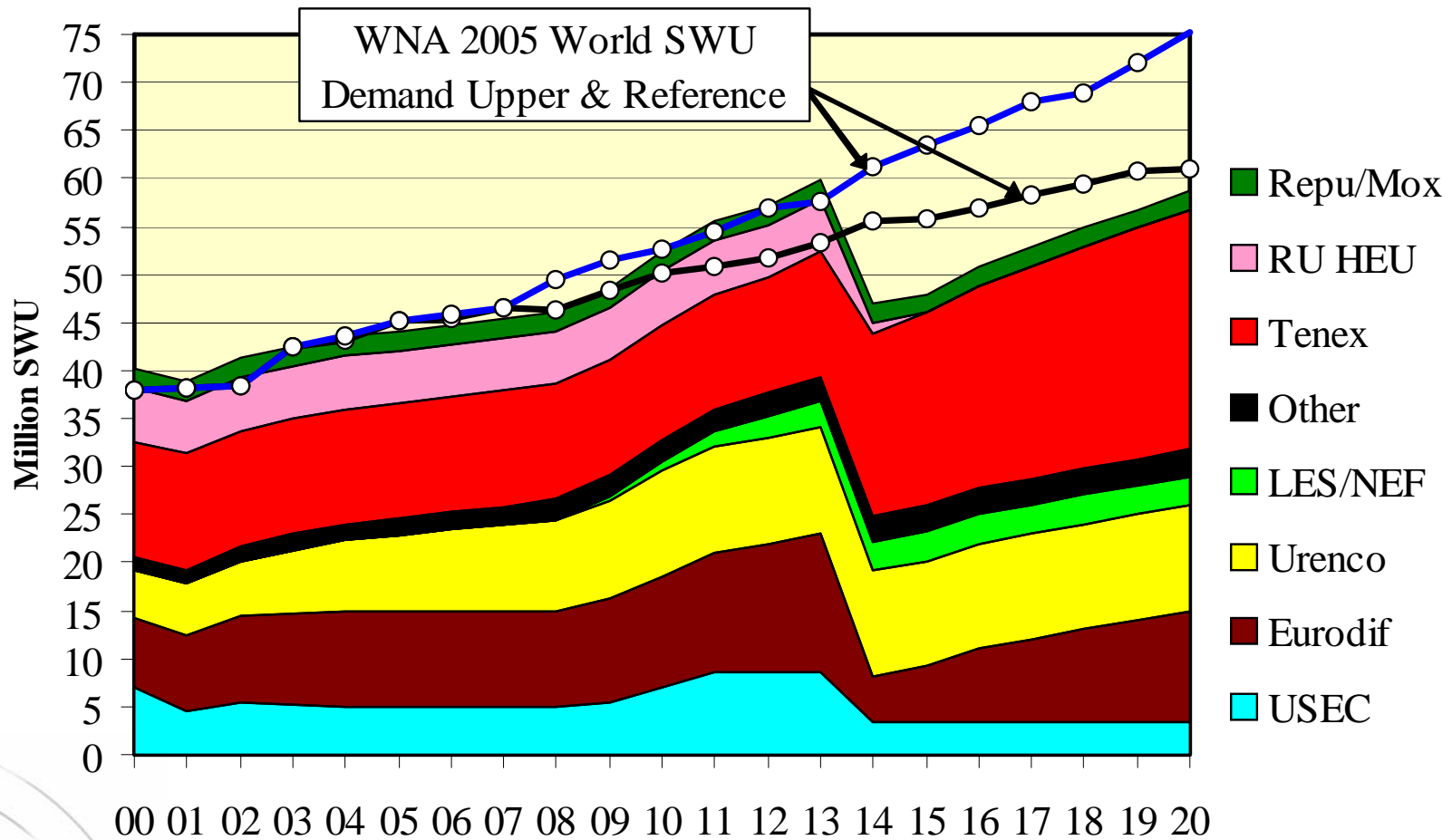
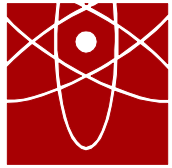
Ux SWU Prices, 1994-2006



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Expected Enrichment Production

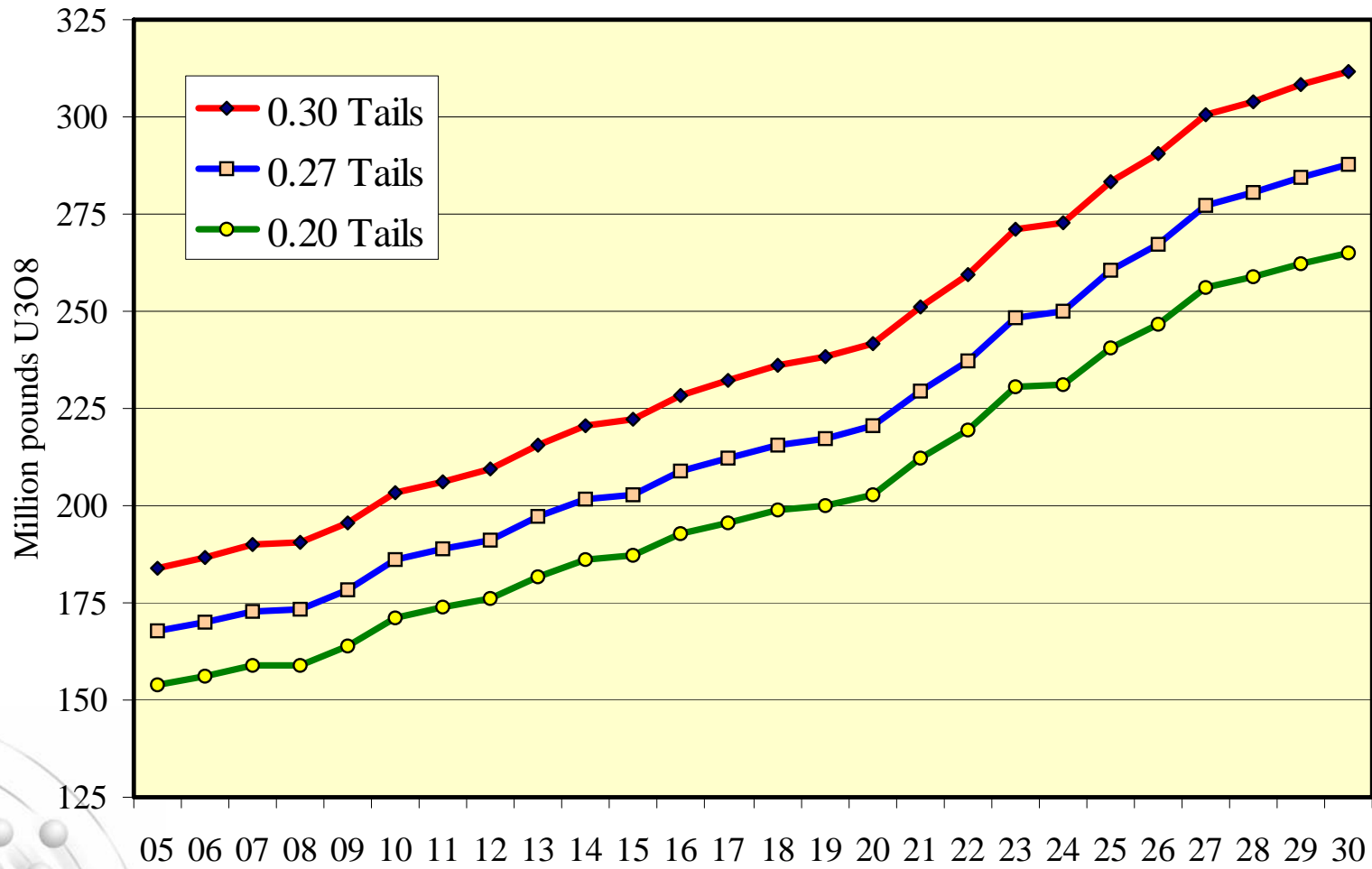


* Tenex production does not include tails re-enrichment.

Source: *Enrichment Market Outlook*, May 2006



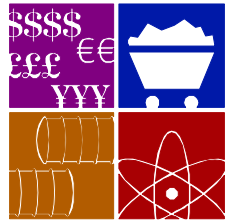
Uranium Requirements at Different Tails Assay



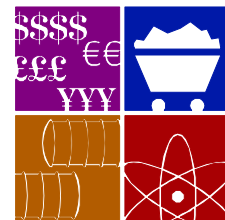
Source: World Nuclear Association, September 2005



Government Involvement

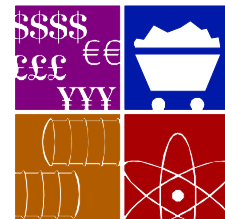


- ▶ **Governments Still Have Large Impact**
 - Import Restrictions
 - Inventory Sales/Disposition Policies
 - Production/Exploration Policies
- ▶ **“Eastern” Countries Promoting Production, Exploration, Securing Supplies in General**
- ▶ **Australia Considering Supply Options**
- ▶ **Nonproliferation Demand for Fuel Created**



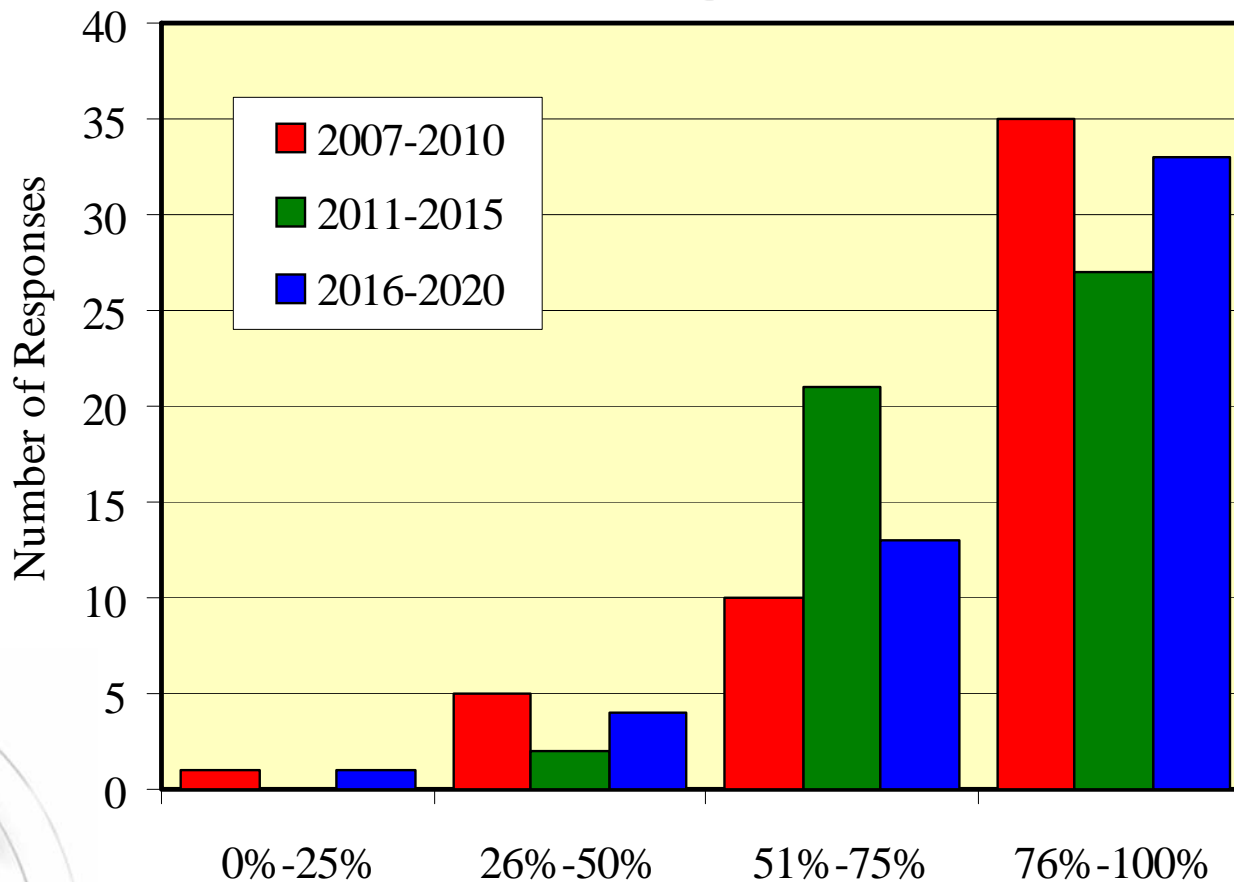
Critical Juncture

- ▶ **First Cores on the Horizon**
- ▶ **Price Under Considerable Upward Pressure**
- ▶ **Uranium Production Response Wanting**
- ▶ **Questions about Enrichment Expansion**
- ▶ **Utilities Have Limited Supply Choices**
 - Uranium, Enrichment, Conversion
- ▶ **Confidence in Supply Capability Down**
 - Utilities Far More Concerned About Supply Today Than They Were in 2004

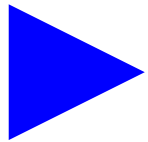
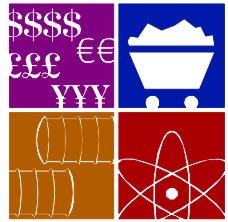


UxC Survey Results

What is your confidence level that U_3O_8/UF_6 supply will meet demand in the following timeframes?



Market Report Card



D +

