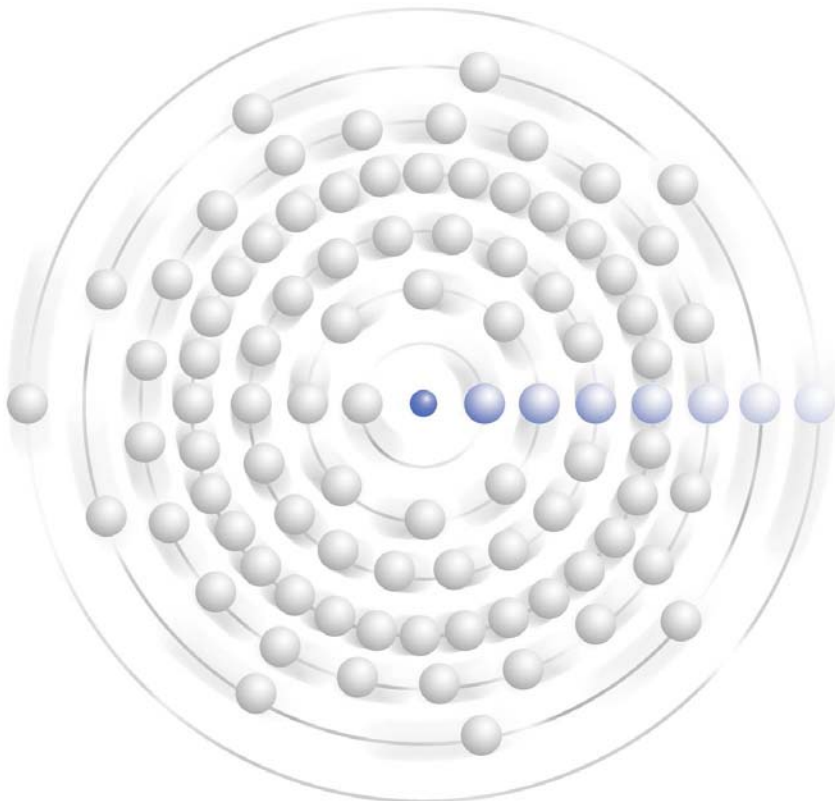




Impact of Kazakh Production on the Uranium Market: Past and Prospective



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1 – Introduction & Overview

One of the most significant developments in the history of uranium production has been the dramatic increase in Kazakh production over the past decade. At the beginning of the decade, annual production was less than 5 million pounds U_3O_8 , increasing to over 36 million pounds U_3O_8 by 2009. Importantly, the increase in Kazakh production accounted for 81% of the overall net increase in world uranium production over this period. This increase came at a time when uranium supplies were under considerable pressure, as evidenced by the dramatic increase in uranium prices that occurred during the last decade. It also came at a crucial juncture when the nuclear renaissance was just getting underway, and when questions of future uranium supply availability overhung the market.

To put the increase of Kazakh production into perspective, it is greater than the 24 million pounds U_3O_8 associated with the HEU deal. In fact, given the 14 million pound expansion and the 10 million pound expansion expected this year, in just two years the growth in the rate of Kazakh production will have equaled the uranium contained in the HEU deal. Further, by the end of this year, the rate of Kazakh production will be close to double the annual uranium supply from HEU.

The Kazakh “phenomenon” does not stop with the past and currently planned expansion for this year. In fact, Kazatomprom, the national uranium producer of Kazakhstan, indicates that plans are for Kazakhstan to contribute fully one-third of world uranium production/supply in the future. If Kazakh production expands as indicated this year, Kazakhstan will account for almost 32% of world production, so this claim is not that farfetched. In order to maintain this goal, Kazakhstan will have to continue to expand production, but not to the extent that it has achieved over the past decade. Kazakhstan clearly has the necessary resource base to support future growth. Kazatomprom notes that the country has sufficient resources to sustain its 2009 production level for 149 years.

Indeed, a number of countries are counting on Kazakh production to fuel their growing nuclear power programs. These countries include those with the world’s fastest-growing nuclear power programs: China, India, Korea, Russia, and Japan. These countries have interests or are considering taking interest in various Kazakh uranium projects. Major producers, such as AREVA, Cameco, ARMZ, and Uranium One are counting on getting a large share of their future supplies from joint ventures in Kazakhstan.

More recently, the Kazakh government has begun to rethink their expansion plans, as uranium prices have been under downward pressure, although planned expansion of nuclear power is still largely intact. Some of the newer Kazakh projects are deeper and thus uranium recovery will be more costly, requiring higher prices and long-term contracts to support development.

This discussion brings up a number of questions, including:

- What was the past impact of Kazakh production on the uranium market and price? To put it another way, how much higher would price be today or in the intervening years had Kazakh production not expanded as much as it did?
- How does Kazakh production impact the market today and what is its likely impact in the future?
- What are the various factors that will determine the level of Kazakh production, both internal and external to the country?
- What strategies have been employed by Kazatomprom and the government of Kazakhstan to expand production and how might they impact future production growth?
- Can Kazakhstan sustain the higher rate of production it hopes to achieve?

This study proposes to examine these questions from a number of perspectives in order to provide the reader with a thorough understanding of Kazakhstan's past and prospective impact on the market and the key drivers behind this impact.

Structure of Report

In order to best address the points identified above, this report has been organized in three main parts. The first looks at the historical impact of Kazakh production expansion on price. The second examines the future of Kazakh production and how it might impact the market. The third consists of three appendices which provide additional background and detail to the discussions that appear in the report

Each of these parts is organized as follows:

- **Part 1**

Chapter 2 provides an historical perspective of Kazakhstan production expansion relative to the expansion achieved by other countries and other market developments.

Chapter 3 lists the factors to be considered when assessing the impact of Kazakhstan's production expansion on the market.

Chapter 4 measure the past price impact of Kazakh expansion using four measures: 1) survey results, 2) production cost analysis, 3) econometric (regression) analysis, and 4) a comparative approach.

- **Part 2**

Chapter 5 provides an overview of the second part of the report and presents a case study of the United States, a country that greatly expanded production but was not able to sustain its production gains.

Chapter 6 details the nature of Kazakhstan’s resource base and projects that form the foundation for future expansion.

Chapter 7 looks at the policies pursued by the government and the actions that it is taking now and may likely take in the future that will impact production.

Chapter 8 addresses the other factors impacting production growth, including infrastructure issues, tax and transfer pricing policy, political risk, financing, and international perception.

Chapter 9 examines the impact of future Kazakhstan production on the market through 2020 under different demand and production scenarios. The potential price impact of Kazatomprom not expanding beyond 20,000 MTU per year is analyzed here as well.

Chapter 10 looks further into the future and considers the question of the sustainability of Kazakh production and the factors that are most likely to impact that sustainability.

- **Part 3**

Appendix A contains an essay from our Q2 2008 Uranium Market Outlook (UMO) report entitled “The Kazakh Phenomenon” that presents a detailed look at Kazakhstan’s production situation in early 2008.

Appendix B presents an excerpt from the essay in our Q1 2008 UMO that provides background on how regression analysis can be used to project uranium production.

Appendix C presents an excerpt from our Q1 2010 UMO essay that provides additional information on consumer interest in Kazakh production.