



Global Nuclear Fuel Inventories



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Introduction & Overview

UxC, LLC (UxC) is pleased to present our fifth edition of this special report on the topic of *Global Nuclear Fuel Inventories* (GNFI). The inaugural edition of this report, published in December 2015, represented a first-of-a-kind effort by UxC to assemble and categorize all the available information related to nuclear fuel inventories around the world and provide insights and analysis on this important topic. Since that first edition, UxC has continued to closely track the global market situation and specific issues related to inventories. Our latest 2024 edition further expands upon the previous reports by providing updated data on global nuclear fuel inventories along with enhanced analysis of the latest trends affecting these inventories.

There is perhaps no bigger issue to emerge in the nuclear fuel markets over the last decade than the growing influence of inventories, especially following the drop in global demand after the March 2011 Fukushima accident. This updated 2024 report presents UxC's detailed research and analysis on the topic of inventories to expand market understanding of this important issue and to provide expert forecasts regarding the future role that inventories will play in all the nuclear fuel market sectors.

Purpose of Report

There are many questions surrounding the current state and future outlook nuclear fuel inventories. This report's primary objective is to provide comprehensive analyses and forecasts and respond to these and related questions. Some of the most critical questions that this report attempts to answer include the following:

- What are the total current inventory levels in each key region/country?
- Who holds these inventories and in what form?
- Where could we see future increases or reductions in inventories?
- How do current inventory levels compare to previous estimates?
- How much of these inventories is pipeline versus strategic?
- How much of these inventories can be considered “excess” or “unobligated?”
- What is the mobility of excess inventories and what factors affect how unwanted holdings may be sold or disposed of?
- What is the likely future course of disposition for government-held inventories?
- What is the potential future impact of these inventories on each of the three nuclear fuel component markets (uranium, conversion, and enrichment)?
- What critical market conditions will influence the state of inventories over the long-term?

What's New in the 2024 Edition?

With this fifth edition of the GNFI report, we have made several important enhancements and added new features to address the current market conditions, including:

- Updated data and analysis of all utility, supplier, trader/financial, and government inventory levels.
- Provided new insights into the level of utility forward coverage rates and how these could evolve in the coming years.
- Included detailed reviews of nuclear fuel inventory-related financial data of individual utilities from the past ten years.
- Updated individual profiles of EU nuclear power countries given unique differences among each in terms of inventory policies and utility approaches.
- Revised forecasts for future inventory buying and disposition, with detailed insights for the uranium, conversion, and enrichment sectors.
- Added new insights into how financial-led buying of uranium by investment funds and junior miners has impacted the inventory situation.
- Updated our analysis of U.S. and Russian government stockpiles and their likely future usage as well as new policies that could shape government inventories going forward.
- Refreshed analysis of international fuel banks to highlight the unique role that these sequestered pockets of material play in the global nuclear industry.
- Increased analysis of the market impacts of inventories and key considerations for all market players for all three fuel cycle component sectors.
- New analysis on the role of inventories in the face of supply risks, including recent supply shocks and increasing market uncertainties due to such developments as the COVID-19 pandemic and Russia's invasion of Ukraine.

Structure of Report

In addition to this **Introduction & Overview**, the report includes the following four chapters:

Chapter 1 – Inventories in Context introduces the key factors that frame the topic of nuclear fuel inventories, including historical perspectives and important market considerations. The chapter also briefly covers the main types of inventories and their holders as well as some of the primary reasons for the current excess inventory supply situation.

The next three chapters include the bulk of the research information compiled for this report. Detailed examinations of each of the inventory holding groups are presented,

including current inventory levels, forward coverage, and future needs for inventories, as well as potential future disposition trends. These chapters proceed as follows:

Chapter 2 – Assessing Current Inventories: Utilities, which includes detailed inventory discussions of nuclear power plant operators in all major countries and regions around the world.

Chapter 3 – Assessing Current Inventories: Suppliers & Intermediaries, which focuses on inventories held by major nuclear fuel suppliers and other market participants, such as from the trading and financial communities.

Chapter 4 – Assessing Current Inventories: Governments & Others, which analyzes the state of U.S. and Russian government inventories, along with international fuel banks and other unique holdings, such as civilian plutonium stockpiles.

Chapter 5 – Market Analysis and Global Forecasts presents UxC’s market impact analysis and forecasts for future inventory growth and disposition and how these will affect the three nuclear fuel commodity markets – uranium, conversion, and enrichment. The chapter includes a detailed summary of the current estimates for the world’s nuclear fuel inventories along with a comparison with our previous estimates presented in 2022 to provide a view of how global inventories have shifted over the past two years. Multiple scenarios for future inventory growth/disposition are also examined along with relevant market implications. Additional detailed analyses of factors influencing the current and future trends in inventories as well as the overall market impacts of inventories are also provided. These include analyses on the level of current “excess” inventories and their mobility as well as potential implications on inventory holdings of the COVID-19 supply shocks in 2020, the surge in financial-led uranium buying in 2021, Russia’s invasion of Ukraine in 2022 and fallout from the Ukraine war over the past two years. Included as well as an updated historical analysis of uranium inventories over the past two decades since 2000 and what recent elevated inventory levels could mean for the long-term outlook of the market.

Chapter 6 – Summary and Conclusions summarizes the key points of this report and offers some final thoughts on the nature of inventories and how they fit into the broader nuclear fuel markets.