



# Global Nuclear Fuel Inventories



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# Table of Contents

<b>Introduction &amp; Overview</b>	<b>7</b>
Purpose of Report	7
What's New in the 2024 Edition?	8
Structure of Report	8
<b>1 – Inventories in Context</b>	<b>10</b>
Fundamentals of Inventories	10
• The Nuclear Fuel Cycle	10
• Forms of Inventories	12
• Inventory Holders	13
Utility Inventories	14
• Types of Inventories	14
Pipeline	14
Strategic	14
Other	14
• Brief History of Regional Utility Inventories	15
United States	15
Europe	16
Japan	17
China, Russia, South Korea, and India	17
Supplier Inventories	18
Government Inventories	20
• United States	20
• Russia	20
Inventories and the Market	21
Other Inventory Developments	25
• Financial Inventories	25
• Nuclear Fuel Banks	26
Inventories Created by Excess Enrichment Capacities	27
<b>2 – Assessing Current Inventories: Utilities</b>	<b>28</b>
United States	28
• Current Inventory Levels	28
Analysis of Recent EIA Data	30
• Individual Utility Data	30
• Inventory Changes Since 2022 Report	32
• Location of Inventories	32
• Forward Coverage	32
• Impact from Recent Market Developments	33
• Future Outlook	33
European Union	35
• Current Inventory Levels	35
• Individual EU Country and Utility Profiles	36
France – EDF	37
Sweden – Vattenfall & Uniper	37
Spain – ENUSA (Endesa, Iberdrola, & Naturgy)	37
Belgium – Synatom (Electrabel)	38
Finland – TVO & Fortum	38
Netherlands – EPZ	39
Czechia – CEZ	39
Slovakia – Slovenské Elektrárne	39
Romania – SNN	40
Hungary – MVM Paks	40
Bulgaria – Kozloduy	40
• Inventory Changes Since 2022 Report	40
• Location of Inventories	41
• Forward Coverage	41
• Impact from Recent Market Developments	41
• Future Outlook	42

Japan.....	43
• Current Inventory Levels.....	43
• Inventory Changes Since 2022 Report.....	45
• Location of Inventories.....	46
• Forward Coverage.....	46
Impact of Future Fuel Deliveries.....	50
• Future Outlook.....	50
Future of Japan's Closed Nuclear Fuel Cycle.....	53
China.....	54
• Current Inventory Levels.....	54
Inventory Forms.....	56
Total Inventory Quantities.....	57
• Inventory Changes Since 2022 Report.....	57
• Location of Inventories.....	58
• Forward Coverage.....	58
• Future Outlook.....	59
Future Uranium Imports.....	61
Future of Inventories.....	63
Other Utilities.....	64
• United Kingdom – EDF Energy.....	64
• South Korea – Korea Hydro and Nuclear Power (KHNP).....	65
• Russia – Rosenergoatom.....	65
• Canada – Bruce Power, OPG, and NB Power.....	66
• Ukraine – Energoatom.....	66
• India – Nuclear Power Corporation of India Ltd. (NPCIL).....	67
• Others.....	68
Taiwan – Taipower.....	68
Switzerland – Axpo & KKG.....	69
Mexico – CFE.....	69
Brazil – Eletronuclear & INB.....	69
Argentina – NA-SA & Dioxitek.....	69
South Africa – Eskom.....	70
UAE – ENEC.....	70
Pakistan – PAEC.....	70
Iran – Bushehr NPP.....	71
Belarus – Belenergo.....	71
Armenia – Metzamor NPP.....	71
• Inventory Changes Since 2022 Report.....	72
• Summary.....	73
<b>3 – Assessing Current Inventories: Suppliers &amp; Intermediaries</b> .....	<b>74</b>
Suppliers.....	74
• U.S. Supplier Data.....	74
• Orano.....	76
• Cameco.....	76
• Urenco.....	77
• Russian Suppliers: ARMZ, Uranium One, TENEX, and TVEL.....	78
ARMZ.....	78
Uranium One.....	78
TENEX.....	78
TVEL.....	79
• Kazatomprom.....	80
• Navoiyuran.....	81
• Fabricators – Framatome, Westinghouse, GNF, KEPCO, etc.....	81
• Other Suppliers.....	82
Junior Miner Purchases of Spot Uranium.....	83
Traders and Financials.....	84
• Brokers.....	84
• Traders.....	84
• Banks.....	85
• Hedge Funds.....	86

• Publicly Traded Uranium Funds.....	87
Sprott Physical Uranium Trust (SPUT) .....	87
Yellow Cake plc (YCA) .....	88
Uranium Royalty Corporation (URC) .....	88
Zuri-Invest AG .....	88
ANU Energy Ltd.....	89
Summary of Investment Fund Holdings.....	89
• Changes in Financially-Held Inventories.....	90
Summary.....	91
• Inventory Changes Since 2022 Report .....	91
• Future Outlook .....	91
<b>4 – Assessing Current Inventories: Governments &amp; Others</b> .....	<b>92</b>
United States Government.....	92
• Highly Enriched Uranium .....	94
HEU Downblending Offering for Tritium (DBOT) .....	94
• U.S. and Russian-Origin Natural UF <sub>6</sub> .....	95
• Off-Spec UF <sub>6</sub> and Non-UF <sub>6</sub> .....	96
• Depleted Uranium as UF <sub>6</sub> .....	97
Depleted Uranium – 2012 Program .....	98
Depleted Uranium – Global Laser Enrichment (GLE).....	98
• Other U.S. Inventory Categories.....	99
Plutonium .....	99
MOX Backup Inventory Program.....	100
• Uranium Reserve and Other Inventory Building Initiatives .....	101
Uranium Reserve.....	101
LEU Production Initiative .....	101
HALEU Production Initiative .....	102
• Disposition of Excess U.S. Government Inventories .....	104
UxC Forecasts for U.S. Government Inventory Disposition .....	105
• Summary.....	105
Russian Government .....	107
• Reprocessed Uranium .....	107
• Slightly Irradiated Uranium.....	108
• Highly Enriched Uranium .....	109
HEU Feed Monitored Inventory .....	110
• Plutonium .....	110
• Depleted Uranium .....	112
• Summary.....	113
Multilateral Security of Supply Mechanisms: Fuel Banks.....	115
• Russia’s Fuel Bank .....	115
• American Assured Fuel Supply.....	116
Potential Expansion of AAFS.....	117
• IAEA Fuel Bank.....	117
• Summary.....	117
Other Inventories.....	118
• Excess Military and Civilian Separated Plutonium.....	118
• Reprocessed Uranium .....	120
France .....	121
Japan.....	121
UK .....	122
Others.....	122
• Iran.....	123
<b>5 – Market Analysis and Global Forecasts</b> .....	<b>124</b>
Total Global Inventories .....	124
• Changes in Totals Since 2022 Report .....	125
Factors Contributing to Current Inventory Conditions .....	127
• Legacy of a Thwarted Nuclear Renaissance .....	127
• Shifting Market Mentality.....	127
• Reduction Cutbacks Leading to Inventory Work-Off.....	128
• Excess Inventories Shifting Hands .....	128

• Security of Supply Becomes a Top Priority .....	128
Pipeline vs. Strategic vs. Excess Inventories .....	129
• Utilities.....	129
Regional Utility Analysis.....	130
• Suppliers .....	130
• Traders and Financials.....	131
• Governments.....	131
• Summary.....	131
Inventory Mobility .....	132
• Forms of Inventories .....	132
• Locations of Inventories .....	133
• Holders of Inventories .....	134
• Other Considerations .....	134
• Mobility of Japanese Inventories.....	134
Market Shocks Affecting Inventories since 2020.....	136
• Potential for Additional Inventory Buying .....	136
• Potential for Additional Inventory Disposition.....	136
Security of Supply vs. Costs.....	137
National Security Policies Influencing Inventory Levels .....	138
Uranium Inventory Forecasts and Market Analysis.....	139
• Inventory Growth vs. Disposition .....	139
Inventory Growth.....	139
Inventory Disposition.....	139
• UxC Forecasts .....	140
Base Case .....	140
• Utility Forecast.....	140
• Global Forecast.....	141
High Case .....	143
Low Case .....	144
• Market Analysis.....	145
China's Outsized Global Role .....	146
Conversion Inventory Forecasts and Market Analysis .....	147
• UxC Forecasts .....	147
Base Case .....	147
High and Low Cases .....	148
• Market Analysis.....	149
Enrichment Inventory Forecasts and Market Analysis .....	150
• Inventory Forecasts.....	150
Base Case .....	150
High and Low Cases .....	151
• Market Analysis.....	152
Government Inventory Disposition Forecast .....	153
• U.S. Government Dispositions .....	153
• Russian Government Dispositions.....	154
• Uranium Disposition Forecasts .....	155
Base Case .....	155
High and Low Cases .....	155
Conversion Market Impacts .....	156
• Enrichment Disposition Forecasts.....	156
• Market Analysis.....	158
A Future of Persistent High Inventories?.....	159
Long-Term Market Outlook .....	161
<b>6 – Summary and Conclusions .....</b>	<b>162</b>

# List of Figures

Figure 1. The LWR Nuclear Fuel Cycle .....	10
Figure 2. U.S. Inventory Holdings, 1983-2023 .....	15
Figure 3. EU Utility Inventory Holdings, 2005-2023 .....	16
Figure 4. U.S. Supplier/Broker/Trader Inventory Holdings, 1987-2023.....	19
Figure 5. World Uranium Production, Requirements, and Prices, 1948-2023 .....	21
Figure 6. Ux U <sub>3</sub> O <sub>8</sub> Spot Price, 1987-2024 .....	23
Figure 7. Spot Purchases of Uranium, 1990-2024 .....	23
Figure 8. Historical Buildup and Drawdown of Uranium Inventories, 1948-2023.....	24
Figure 9. SWU vs. Uranium Feed Requirements at Various Tails Assays .....	27
Figure 10. U.S. Utility Inventories by Form, 1983-2023 .....	29
Figure 11. EU Utility Inventories, 2005-2023.....	35
Figure 12. Japanese Utility Nuclear Fuel Holdings, 2010-2024 .....	45
Figure 13. UxC Forecast Scenarios for Japanese Reactor Restarts, 2015-2030 .....	48
Figure 14. China Uranium Supply/Demand Balance, 2000-2024 .....	55
Figure 15. China Nuclear Fuel Imports by Form, 2000-2024 .....	56
Figure 16. China Uranium Imports by Country of Origin, 2001-2024 .....	61
Figure 17. U.S. Supplier Inventories, 1987-2023 .....	74
Figure 18. U.S. Supplier vs. Broker/Trader Inventories, 2004-2023 .....	75
Figure 19. Financial & Junior Uranium Holdings, Q1-2018 to Q3-2024.....	90
Figure 20. Breakdown of DOE's Depleted UF <sub>6</sub> Inventory.....	97
Figure 21. Slightly Irradiated Uranium (SIU) and Depleted SIU as Byproduct of Pu Production .....	108
Figure 22. Global Plutonium Inventories as of 2020 .....	119
Figure 23. Global Civilian Plutonium Inventory Changes, 1945-2020.....	119
Figure 24. UxC Base Case Forecast for Global Uranium Inventories, 2008-2040 .....	142
Figure 25. UxC High Case Forecast for Global Uranium Inventories, 2008-2040 .....	143
Figure 26. UxC Low Case Forecast for Global Uranium Inventories, 2008-2040 .....	144
Figure 27. UxC Base Case Utility Inventory Forecast without China, 2008-2040.....	146
Figure 28. UxC Base Case Forecast for Global Conversion Inventories, 2008-2040.....	148
Figure 29. UxC Base Case Forecast for Global Enrichment Inventories, 2008-2040.....	151
Figure 30. UxC Base Case Forecast for Government Inventories in U <sub>3</sub> O <sub>8e</sub> , 2008-2040.....	155
Figure 31. UxC Forecast Cases for Government Inventories in U <sub>3</sub> O <sub>8e</sub> , 2008-2040 .....	156
Figure 32. UxC Base Case Forecast for Government Inventories in SWU, 2008-2040 .....	157
Figure 33. UxC Estimates for Global Commercial Inventories, 2000-2023.....	159
Figure 34. UxC Estimates of Commercial Inventories by Holder, 2000-2023.....	160

## List of Tables

Table 1. Examples of Past Nuclear Supply Chain Production Events .....	18
Table 2. U.S. Utility Inventories in 2023 .....	29
Table 3. Recent Changes in U.S. Utility Inventories, 2020-2023 .....	30
Table 4. U.S. Utility Nuclear Fuel Holdings Financial Values, 2014-2023 .....	31
Table 5. U.S. Utility Forward Coverage Levels, 2012-2023 .....	32
Table 6. EU Utility Inventories in 2023 .....	36
Table 7. EDF Nuclear Fuel Inventory Financial Values, 2014-2023 .....	37
Table 8. Vattenfall Nuclear Fuel Inventory Financial Values, 2014-2023 .....	37
Table 9. TVO & Fortum Nuclear Fuel Inventory Financial Values, 2014-2023 .....	38
Table 10. EU Utility Forward Coverage Levels, 2012-2023 .....	41
Table 11. Japanese Utility Inventory Estimates as of March 2024 .....	44
Table 12. Japanese Utility Inventories in 2024 .....	45
Table 13. UxC Base Case Forecast for Japanese Reactors Operating by Utility, 2024-2040 .....	47
Table 14. UxC Base Case Uranium Requirements Forecast for Japanese Utilities, 2024-2040 .....	48
Table 15. Japanese Utility Inventories vs. Requirements, 2024-2040 .....	49
Table 16. Chinese Uranium Inventory Growth, 2009-2024 .....	55
Table 17. Chinese Utility Inventories in 2024 .....	57
Table 18. UxC Forecast Scenarios for China, 2024-2040 .....	60
Table 19. Total China Uranium Imports by Country, 2001-2024 .....	61
Table 20. EDF Energy Nuclear Fuel Inventory Financial Values, 2014-2023 .....	64
Table 21. Nuclear Fuel Inventory Estimates for Other Country Utilities as of 2024 .....	73
Table 22. Cameco Inventory Holdings at Year-End, 2016-2024 .....	76
Table 23. TVEL Inventory Holdings .....	80
Table 24. Investment Fund Holdings in 2024 .....	89
Table 25. Supplier & Investor Inventories in 2024 .....	91
Table 26. Total Volumes of U.S. Government Inventories in 2024 .....	93
Table 27. UxC Base Case Forecast for U.S. Government Inventory Disposition, 2023-2040 .....	105
Table 28. Total Volumes of Russian Government Inventories in 2024 .....	114
Table 29. Multilateral Security of Supply Mechanisms (Fuel Banks) in 2024 .....	117
Table 30. Civilian Plutonium Inventories, December 31, 2022 .....	118
Table 31. Total Global Nuclear Fuel Inventories as of 2024 .....	124
Table 32. Volumetric Changes to Total Global Nuclear Fuel Inventories since 2022 Report .....	126
Table 33. Percentage Changes to Total Global Nuclear Fuel Inventories since 2022 Report .....	126
Table 34. Estimate for Global Desired Utility Inventories .....	129
Table 35. Estimate for Regional Desired Utility Inventories .....	130
Table 36. UxC Base Case Forecast for Global Utility Inventories, 2023-2040 .....	141
Table 37. UxC Base Case Forecast for Global Uranium Inventories, 2023-2040 .....	142
Table 38. UxC High Case Forecast for Global Uranium Inventories, 2023-2040 .....	143
Table 39. UxC Low Case Forecast for Global Uranium Inventories, 2023-2040 .....	144
Table 40. UxC Base Case Forecast for Global Conversion Inventories, 2023-2040 .....	148
Table 41. UxC Base Case Forecast for Global SWU Inventories, 2023-2040 .....	151
Table 42. UxC Base Case Forecast for Government Inventories in U <sub>3</sub> O <sub>8e</sub> , 2023-2040 .....	155
Table 43. UxC Forecast Cases for Government Inventories in U <sub>3</sub> O <sub>8e</sub> , 2023-2040 .....	156
Table 44. UxC Base Case Forecast for Government Inventories in SWU, 2023-2040 .....	157



## 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

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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?

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## What's New in the 2024 Edition?

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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.

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## Structure of Report

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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.