Essays from UxC's *Enrichment Market Outlook*

Toggle Descriptions

Date	Title/Description
Q4 2018	**Analyzing Centrifuge Lifetimes and Future Replacements** This issue's essay, "Analyzing Centrifuge Lifetimes and Future Replacements," takes a closer look at all the centrifuge-based enrichment plants around the world and examines when each facility may begin to see a decline in output if no new machines are installed. This analysis aims to understand the potential timing for when the current fleet of centrifuges becomes obsolescent and how much new capacity may be needed to replace them to ensure that future demand for SWU is sufficiently met.
Q3 2018	**Making Sense of the Spot SWU Market and Spot Indicator** This issue's essay, "Making Sense of the Spot SWU Market and Spot Indicator," provides a detailed discussion on the small but important spot SWU market as well as an analysis of how the spot market influences the broader enrichment industry. UxC's proprietary spot SWU price projection to 2035 is also presented along with a discussion of how utilities and other market participants may best apply this indicator in their procurement and business planning strategies.
Q2 2018	**China's Impact on the Global Enrichment Market** This issue's essay, "China's Impact on the Global Enrichment Market," discusses the latest situation regarding China's enrichment program, including the outlook for SWU demand and supply over the long-term. The essay then analyzes China's impact on the global enrichment industry and SWU prices through a specialized sensitivity modeling effort.
Q1 2018	**A New Era of Low Operating Tails** This issue's essay, "A New Era of Low Operating Tails," discusses the critical role of enricher underfeeding plus upgrading of previously-discharged depleted uranium in today's nuclear fuel market, including how these activities have helped enrichers bridge the post-Fukushima SWU demand gap and the long-term future implications of this new very low operating tails environment.
Q4 2017	**SWU Delivery Prices and Market Price Formation** This issue's essay, "SWU Delivery Prices and Market Price Formation," discusses the importance of average SWU delivery prices for the enrichment industry, examines the relationship between average delivery prices and market prices, and provides a forecast of average delivery prices through 2030.
Q3 2017	**Defying the Limits: Russia's Capacity Optimization** This issue's essay, "Defying the Limits: Russia's Capacity Optimization," examines the latest status of Russia's enrichment industry with specific analysis of the country's latest efforts to optimize its enrichment capacities, including the possible complete phaseout of the Siberian Chemical Combine (SCC) accomplished through the transportation of working centrifuges from SCC to another enrichment plant in Russia.
Q2 2017	**The Increasing Role of EUP Inventories** This issue's essay, "The Increasing Role of EUP Inventories," analyzes the latest situation with EUP inventory buildup because of premature reactor shutdowns and ongoing enrichment supply overcapacities. The essay also presents the results of new UxC modeling that examines what impact EUP inventories have on the current and future SWU prices.
Q1 2017	**Enrichment's Changing Landscape** This issue's essay, "Enrichment's Changing Landscape" examines the various ways in which the enrichment industry is shifting in the face of new market and technology dynamics. This includes the growing role that underfeeding and tails re-enrichment are playing and how enrichers are now targeting the open uranium market.
Q4 2016	**China's Enrichment Industry – Status and Prospects** This issue's essay, "China's Enrichment Industry – Status and Prospects" provides an in-depth review and analysis of the growing uranium enrichment program in China. Specifics regarding China's enrichment technology development, the pace of SWU capacity growth, and prospects for Chinese SWU and EUP sales to international customers are examined in detail.
Q3 2016	**Are Low Prices a Danger to the SWU Industry?** This issue's essay, "Are Low Prices a Danger to the SWU Industry?" examines the question of whether the current situation in enrichment is likely to result in a future price spike like that seen for uranium in the last decade. The essay compares and contrasts the situation in enrichment today with which existed in uranium prior to the price spike. It also identifies potential dangers the enrichment industry could face relating to issues that are unique to enrichment.
Q2 2016	**Centrus – Its Origins and Its Future** This issue's essay, "Centrus – Its Origins and its Future," discusses the history, background, and current situation of the enrichment company Centrus Energy. Centrus' current identity and role in the industry has created some confusion as to how it is now regarded, both by utility buyers and enrichment competitors. In this essay, we attempt to more clearly define the SWU supplier that Centrus was, the company it is today, and where Centrus may be heading in the future.
Q1 2016	**Towards a Better SWU Supply/Demand Representation** This issue's essay, "Towards a Better SWU Supply/Demand Representation," presents changes we are making to our SWU supply and demand charts, both to update supply and demand and to better account for the use of excess SWU capacity in the creation of natural UF6 and EUP inventories. We will also touch on similar changes we have made to our uranium supply and demand charts, and talk about further enhancements we plan to make when we move to our Integrated Nuclear Fuel Market model.
Q4 2015	**Paradigm Shift: New Russian Approach to Enrichment** This issue's essay, "Paradigm Shift: New Russian Approach to Enrichment," examines the evolution of Russia's enrichment business as it transitioned from using its capacity to supply "noncommercial" contracts to becoming more oriented to the world market, only to find that it had to face the realities of a post-Fukushima market. As a consequence, Russia has had to take other steps to deal with its excess capacity situation, and the essay looks at what these reactions mean for future enrichment supply from Russia.
Q3 2015	**A Closer Look at SWU Supplies and Requirements** This issue's essay, "A Closer Look at SWU Supplies and Requirements," segregates China's SWU supplies and requirements and Russia's supplies dedicated to underfeeding and its supplies and requirements dedicated to servicing its traditional clients in order to present a rest-of-world (ROW) market. The ROW market is then analyzed separately to represent the situation facing the ROW suppliers, which include AREVA, Russia, and URENCO.

Q2 2015 **SWU on Sale**

This issue's essay, "SWU on Sale," lays out the unique set of circumstance that have resulted in today's record low SWU prices, when viewed on a real dollar basis. The essay looks at the five key factors influencing the SWU price, and notes that all of these now favor lower prices. Further, it explains how it has been the unique combination of these factors that have led to the record-low prices. The essay concludes by discussing the potential future trends of these factors and the implications of these for future price levels.

Q1 2015 **The Estimated Impact of Recycling on the SWU Market**

This issue's essay, "The Estimated Impact of Recycling on the SWU Market," examines the extent to which recycle of mixed-oxide (MOX) and enriched reprocessed uranium (ERU) displaces the need for SWU supply. In doing this, the technical and historical context of reprocessing and recycle is presented, and nonproliferation and related issues are discussed. The essay concludes with a projection of the amount of SWU that will be displaced over the 2014-2030 period, identifying the factors contributing to the projected decline in the use of recycle over time.

Q4 2014 **2014: A Year of Reckoning for Enrichers**

This issue's essay, "2014: A Year of Reckoning for Enrichers," examines a number of factors that likely will make 2014 a watershed year for enrichment. For one, the long-term SWU price fell to its lowest level historically in real terms, and, except for a couple of low-price years in 1990 and 1991, the spot price would be in the same boat. Because of the depressed market, enrichers encountered financial problems, notably AREVA and USEC (now Centrus Energy), and a number of production cutbacks and delays resulted. The biggest development related to the future of Russia, as the West imposed sanctions and Russia's international relations and economy suffered. China re-entered the market, but this likely had more to do with delays in its nuclear build program. As a result of all of these development, the future of enrichment supply has reached a new level of uncertainty with which utilities will have to contend.

Q3 2014 **China's Evolving Role in the Enrichment Market**

This issue's essay, "China's Evolving Role in the Enrichment Market," examines the growing position of China in the global enrichment market as both an exporter as well as importer of SWU. China has been participating in the international enrichment market for over two decades, and, while its role in the market has shifted over the years, the general trajectory has been one of increasing influence on the overall market. This essay reviews China's current demand and supply for SWU, its rationales for exports, and several other facets of its enrichment industry. By analyzing three supply and price forecast scenarios, it provides a framework to assess China's current and future actions as they relate to the enrichment market.

Q2 2014 **An Estimate of Excess EUP/SWU Inventories**

This issue's essay, "An Estimate of Excess EUP/SWU Inventories," addresses the question of excess EUP/SWU inventories around the world and how they might enter the market in the future. These estimates are made largely on the basis of publically available information on nuclear fuel inventories from various sources, along with our estimates of the portion of these inventories that are EUP and, of that, the amount that may be considered excess. Premature reactor shutdowns and delays in restarts have made the buildup of excess inventories a growing consideration in the market, and the essay represents our attempt to quantify these supplies.

Q1 2014 **Transition to the SWU-PRICE® Model**

This issue's essay, "Transition to the SWU-PRICE® Model," addresses changes to both the assumption sets and our forecast outputs related to our transitioning to SWU-PRICE® as our main analytic tool for the enrichment market. While these changes are not dramatic and in some cases are very minor, especially on the input side, it is important for our readers to fully understand them. On both the input and especially the output side, SWU-PRICE® affords us both with more forecasting flexibility and a better way of quantifying results, and this should be of great benefit in our future analyses.

Q4 2013 **End of an Era: The HEU Agreement and Beyond**

This issue's essay, "End of an Era: The HEU Agreement and Beyond," examines the HEU deal from an historical standpoint, and addresses the impact of the deal's end on the parties to the deal and nuclear fuel market as a whole. In this regard, the essay takes a close look at the fate the Russian enrichment plants, Russia's enrichment industry after the HEU Agreement, and the fate of USEC. Looking forward, we turn to examining the likelihood of follow-on to the HEU Agreement as well as the prospects for the SWU and uranium markets in the post-HEU era.

Q3 2013 **Who's in Control: A Look Back and Forward**

This issue's essay, "Who's in Control: A Look Back and Forward," updates an essay we first presented in May 2001 addressing the question of the relative position of enrichers and other players with respect to the future evolution of the enrichment market. This essay looks at what was said then, what has transpired over the past twelve years, and presents our view of this situation going forward. It also includes new players, such as China, that were not addressed in the initial essay.

Q2 2013 **Development of the UxC SWU-PRICE Model**

This issue's essay, "Development of the UxC SWU-PRICE Model," introduces a new econometric model of the enrichment market being developed for UxC by Dr. Lydia Hsieh. The essay details the structure of the model, presents a historical simulation of its key output – the long-term contract base SWU price, provides some preliminary price forecasts, and concludes by discussing future work to be done.

Q1 2013 **Structural Changes in the SWU Market**

This issue's essay, "Structural Changes in the SWU Market," analyzes key structural changes, such as the shift of geographical demand, technology changes, and SWU supplier market positions, taking place in the worldwide enrichment marketplace today. The essay discusses key items that are impacting SWU demand over the next ten years and how they differ from the SWU market we analyzed in May 2008.

Q4 2012 **The European Trade Case Hits Another Milestone**

This issue's essay, "The European Trade Case Hits Another Milestone," takes a look at the background of the European enrichment trade cases that more or less consumed the industry from 2001-2009 and discusses the recently announced initiation of the second Sunset Review of the Eurodif antidumping order. The essay discusses the origins of the five-year Sunset Review and what has changed in the enrichment market since the last 2007 five-year Sunset Review of the Eurodif case.

Q3 2012 **Nonproliferation & Laser Isotope Separation Technology**

This issue's essay, "Nonproliferation & Laser Isotope Separation Technology," explains and analyzes the debate in the nonproliferation community about the commercialization of the GLE/SILEX project. Even though GLE was recently issued a license by the U.S. NRC to build a commercial facility in Wilmington, NC, the nonproliferation community is still expressing its concerns and the issue has not been fully resolved.

Q2 2012 **R.I.P for GDP**

This issue's essay, "R.I.P. for GDP," takes a look at the history of gaseous diffusion enrichment as this era of SWU supply is drawing to a close. In June, AREVA shut down the Georges Besse I GDP in France, leaving only the Paducah GDP in the United States, which was itself slated to be taken offline except for a last minute deal to keep it operating for another year to enrich tails material held by DOE.

Q1 2012 **The Enrichment Industry One Year after Fukushima**

This issue's essay, "The Enrichment Industry One Year after Fukushima," takes a look at the changes that enrichers have made and are making in response to the lower demand and lower prices following the Fukushima accident. This examination includes the four major enrichers – AREVA, TENEX, URENCO, and USEC – and the non-major enrichers and potential entrants which include China, JNFL, and GLE. This essay ranks the enrichers by the likelihood of them reaching their

targeted capacity by 2020 given the changed circumstances of the market and compares the potential output of the big three enrichers – AREVA, TENEX, and URENCO – with our projected base case demand in 2020.

Q4 2011 **Understanding Long-Term SWU Price Projections**
This issue's essay, "Understanding Long-Term SWU Price Projections," takes a closer look at UxC's SWU price projections in terms of what these represent and thus how they should be interpreted. Unlike in uranium where we project spot prices, in enrichment we project base prices in long-term contracts, as the spot SWU market is not very significant. In this essay, we examine our use of price ranges and scenario analysis, and how these results should be interpreted. These features, as well as projecting prices in terms of current as opposed to constant dollars, are common to both our uranium and SWU price projections. The issue of how to derive delivery prices based on these projections is also addressed.

Q3 2011 **Russia's Enrichment Industry in the Post-Fukushima Era**
This issue's essay, "Russia's Enrichment Industry in the Post-Fukushima Era," looks at the prospects for Russia's enrichment business after the Fukushima accident. As such, it follows the same theme as last quarter's essay, "The Enrichment Market in the Post-Fukushima Era," but takes a more detailed look at how Russia's capacity expansion and marketing in particular might react to the reduction in overall and regional market size stemming from the Fukushima accident. Russia is one of the world's key enrichers, and it had ambitious expansion plans prior to Fukushima. These plans will need to be altered in light of the accident, and this essay explores how this may be accomplished.

Q2 2011 **The Enrichment Market in the Post-Fukushima Era**
Chapter 1 is a topical essay that focuses on important developments or trends in the market. This issue's essay, "The Enrichment Market in the Post-Fukushima Era" looks at the impact that Fukushima has had on projected enrichment demand – on both a global and regional basis – and the resulting impact on enrichers. It examines which enrichers– both current and prospective – might be most affected and how they might react to the reduced market prospects stemming from the Fukushima accident and reactions to it. One of the important outcomes of Fukushima is that it causes demand to be viewed more on a regional than global basis as the accident is impacting different countries and regions in different ways.

Q1 2011 **Tails Re-Enrichment – Is it Worth It?**
This issue's essay, "Tails Re-Enrichment – Is it Worth It?" looks at the historical accumulation of tails material and the economics of tails re-enrichment, considering both enrichment costs and uranium prices. It discusses the potential use of excess SWU capacity at Paducah for tails enrichment following the recent deal between TENEX and USEC and how this might be paid for, given constraints on DOE's sale of the uranium contained in the tails. It also looks at how the Fukushima accident might impact the economics of tails enrichment, as uranium prices have fallen since the accident and may continue to be under downward pressure.

Q4 2010 **Inauguration of AREVA's Georges Besse II Plant**
This issue's essay, "Inauguration of AREVA's Georges Besse II Plant," discusses AREVA's acquisition of centrifuge technology and a description of the construction stages of the GBII plant since its inception in September 2006. It also discusses the December 14, 2010 GBII Opening Ceremony and touches briefly on the operation of the AREVA/Eurodif gaseous diffusion plant and the future AREVA U.S. enrichment plant in Idaho.

Q3 2010 **China's Enrichment Program: A Growing Giant**
This issue's essay, "China's Enrichment Program: A Growing Giant," examines the past, present, and future of the uranium enrichment industry in China, and provides a detailed analysis of the impact from the country's rapidly expanding nuclear power program on the global enrichment market.

Q2 2010 **DOE Loan Guarantees**
This issue's essay, "DOE Loan Guarantees," revisits Title XVII of the Energy Policy Act of 2005 that created the DOE loan guarantee program, discusses many of the details of the program, and looks at recent and future recipients of DOE loan guarantees for new enrichment projects as well as new reactors.

Q1 2010 **Adequacy & Composition of SWU Supplies 2010-2020**
This issue's essay, "Adequacy and Composition of SWU Supplies 2010-2020," looks at the enrichment supply picture for the next decade, by examining the shift in the technology and supplier market shares, the new SWU projects, and the overall adequacy of supply.

Q4 2009 **Perseverance & Determination – LES Readies for Business**
This issue's essay, "Perseverance & Determination – LES Readies for Business," examines presents the work that has taken place to get LES's National Enrichment Facility (NEF) ready to come on line early next year. In doing this, the essay recounts the history of LES, from its founding in 1989, and discusses the various attempts to bring forth a new enrichment plant on U.S. soil, which finally culminated with establishing the site in Eunice, New Mexico. The essay then takes the reader through the construction process, and the unique challenges that LES has faced along the way. It also examines the potential for an expansion of NEF, which has the potential of being the major source of enrichment supply in the United States in the coming decade.

Q3 2009 **Going Supercritical – Russia's Enrichment Industry**
This issue's essay, "Going Supercritical – Russia's Enrichment Industry," examines the recent restructuring of the Russian nuclear fuel enterprise and how this impacts enrichment, the recent allocation of Russian SWU capacity, the planned moderniza-tion of this capacity, and the expected supply of and demand for Russian enrichment going forward.

Q2 2009 **Rethinking the Optimal Tails Assays**
This issue's essay, "Rethinking the Optimal Tails Assay," takes a new look at enrichment tails assays and their place in the market with the introduction of the more advanced and lower-cost technologies that is occurring. To help write this essay, we called on Stephen Turner, an expert in enrichment technology who has served as a consultant to UxC for a number of projects in recent years.

Q1 2009 **Peaceful Coexistence? Nonproliferation Policies & SWU Market**
This issue's essay, "Peaceful Coexistence? Nonproliferation Policies & SWU Market," examines how nonproliferation policies can affect the SWU market. The subject of nonproliferation has received renewed focus in the wake of the nuclear renaissance, as many in the nonproliferation field see the expansion of nuclear power as posing additional proliferation threats. Specific policies examined in the essay include the role of the Nuclear Suppliers Group (NSG), fuel banks, and multinational approaches to SWU supply. The essay notes that it is important for the nuclear industry to be engaged on this front and monitor nonproliferation developments as they can impact the market going forward.

Q4 2008 **Enrichment Technology Company – Coming Into Its Own**
This issue's essay, "Enrichment Technology Company – Coming Into Its Own," takes a look at the Enrichment Technology Company (ETC), including its early history and its activities since emerging as a 50/50 joint venture of Urenco and AREVA in July 2006. The essay contains an in-depth analysis of ETC's future installed centrifuge SWU supply relative to other SWU supply sources.

Q3 2008 **The Evolution of SWU Pricing in a Changing Market**
This issue's essay, "The Evolution of SWU Pricing in a Changing Market," examines how SWU pricing and price reporting has evolved over the years with the changing dynamics of the market, particularly with regard to referencing SWU prices in long-term contracts and today's pricing of SWU at different tails assays.

Q2 **Seismic Shifts in the Post-2013 SWU World**

2008 This issue's essay, "Seismic Shifts in the Post-2013 SWU World," examines the major shifts with respect to SWU supply, demand, and technologies that are coming after 2013, and implications of these for future market shares and prices.

Q1 **Fuel Banks and Other Fuel Supply Assurances**
2008 This issue's essay, "Fuel Banks and Other Fuel Supply Assurances," looks at current proposals for fuel banks and supply assurances, the general objectives of these ap-proaches, the history of these efforts, issues involved with the implementation of the various concepts, and reaction of the nuclear fuel industry to fuel banks and other supply assurances.

Q4 **RSA Amendment: The "In-Between" Option**
2007 This issue's essay, "RSA Amendment: The "In-Between" Option," examines some of the market ramifications of the recently initialed amendment to the Russian Suspension Agreement, including whether this restricts access to Russian SWU any more than U.S. utilities would under their own procurement policies.

Q3 **Future SWU Suppliers – More Than You Think**
2007 This issue's essay, "Future SWU Suppliers – More Than You Think?," focuses on the potential enrichment plans of new entrants to the enrichment business and existing, non-major players who desire to expand their participation in the enrichment business.

Q2 **Russia's Changing Enrichment Industry**
2007 This issue's essay, "Russia's Changing Enrichment Industry," highlights Russia's ambitious enrichment expansion strategy and details how the nation is internally restructuring its nuclear industry to accomplish this goal.

Q1 **Urenco European Expansion – A Quiet Run to the Top**
2007 This issue's essay, "Urenco European Expansion – A Quiet Run to the Top," covers how Urenco has grown into a leader in the enrichment market through a strategy of steadily and systematically developing better-performing, low-cost centrifuge machines while modularly expanding enrichment capacity and gaining market share in response to utility demand. This essay also discusses Urenco's future expansion plans utilizing TC-12 and TC-21 centrifuge machines at the Almelo, Capenhurst and Gronau SWU facilities.

Q4 **Full Steam Ahead For Georges Besse II**
2006 This issue's essay, "Full Steam Ahead For Georges Besse II," covers the challenging but successful effort made by AREVA to gain access to Urenco's proven centrifuge technology for the enrichment of uranium. AREVA now owns 50% of the Enrichment Technology Company (ETC) with Urenco owning the other 50%. ETC is the owner of the former centrifuge development and manufacturing assets of the Urenco company. The essay discusses the many hurdles AREVA had to overcome in getting to the ETC joint venture and describes in detail the current status of the new AREVA Georges Besse II centrifuge enrichment plant being built on the same location as the existing gaseous diffusion enrichment facility in the south of France.

Q3 **The Return of Laser Isotope Separation for Enrichment**
2006 This issue's essay, "The Return of Laser Isotope Separation for Uranium Enrichment" explores the nature of laser isotope separation (LIS), past LIS programs and what they accomplished, why these past programs were abandoned, why the GE/Silex program may be different, and what the impact on the fuel cycle might be if the GE/Silex program is successful.

Q2 **Of Mice and Men … and Future Enrichment**
2006 This issue's essay, "Of Mice and Men … and Future Enrichment: Plans for SWU Replacement, Expansion, New Installation, and the Russian HEU Deal" examines the changing enrichment supply infrastructure due to the replacement of old gaseous dif-fusion technology with newer centrifuge technology, and the expansion of existing centrifuge technology and perhaps the introduction of laser (SILEX) technology.

Q1 **Recycling ... the '70's Look ... is Back in Fashion**
2006 This issue's essay, "Recycling ... the '70's Look ... is Back in Fashion," examines the recently announced Global Nuclear Energy Partnership (GNEP) and its ability to take the U.S. from a non-reprocessing nation to one that considers recycling used fuel as an option in the future.

Q4 **China's Growing Enrichment Needs**
2005 This issue's essay, "China's Growing Enrichment Needs," examines how China's ambitious reactor-construction program will soon result in enrichment demand that will exceed its domestic enrichment capacity and require that enrichment services be sourced abroad.

Q3 **New Capacity – How Much Is Enough?**
2005 This issue's essay, "New Capacity – How Much Is Enough?", examines the question of whether current plans for new facilities and capacity expansions will be sufficient to take care of the problem of rising SWU demand.

Q2 **Non-Proliferation Politics and the Enrichment Market**
2005 This issue's essay, Non-Proliferation Politics and the Enrichment Market, examines the status of proposed measures to combat the proliferation of nuclear material that, if enacted, would directly impact enrichment supply.

Q1 **The Demise of the Secondary SWU Market**
2005 This issue's essay, The Demise of the Secondary SWU Market, reviews the historical perspective of the spot enrichment market and compares how today's market has changed and what role secondary supplies play.

Q4 **Indigenous Enrichment Programs**
2004 This issue's essay reviews the indigenous enrichment programs of Brazil, China, and Japan, and examines the prospects for this supply to affect the market in the future.

Q3 **The End of the USEC Trade Case?**
2004 This issue's essay reviews the recent developments in the enrichment trade case, and examines the likely implications for the market now that competition in returning to a more normal state. In addition, we also update the status of various capacity in-creases and new plant construction underway worldwide.

Q2 **New Enrichment Capacity - How Much Is Too Much?**
2004 This issue's essay examines the status of the three major projects (George Besse II, the National Enrichment Facility, and the American Centrifuge) for new centrifuge enrichment and the two ongoing capacity expansions (Urenco's European facilities and in Russia). Various scenarios are then analyzed on how to collectively bring online this new and expanded capacity, in balance with remaining levels of HEU SWU and a possible follow-on HEU deal. In each of the scenarios, the impact on competition and pricing in the market is examined.

Q1 **The Market Impact of Changing Tails Assays**
2004 This issue's essay examines the effect that rising uranium prices are having on utilities' choice of tails assay under the variable tails clauses of their enrichment contracts. Optimal tails are dropping as the uranium component of the calculation rises, and this dynamic may have other repercussions for SWU prices in the near term.

Q4 **Update on LES Status and Prospects**
2003 This issue's essay updates readers on the status of the LES project to build and license its National Enrichment Facility in New Mexico. After a difficult first half of

the year, the decision to move to a new site with both local and high-level political support has again made LES the front-runner in the quest for new centrifuge capacity in the U.S.

Q3 2003 **The SWU Market Stabilizes - But Will It Last?**
This issue's essay examines the causes of the stability of the SWU price that has characterized the market over the past two plus years and explores whether this stability is likely to persist.

Q2 2003 **France's Nouvelle Direction in Enrichment**
This issue's essay examines the history of France's enrichment program and takes an in-depth look at Cogema's planned shift from gaseous diffusion technology to centrifuge technology. Analysis is given on the recent 50-50 joint venture between Cogema and Urenco encompassing the area of centrifuge enrichment technology, and future ramifications for the market and competitive picture in Europe are highlighted.

Q1 2003 **USEC's Centrifuge Enrichment Program**
This issue's essay takes an in-depth look at USEC's "American Centrifuge" enrichment program, including the history of the GCEP program on which it is based and the progress USEC has made in recent months. While LES struggles with some of the same siting problems that doomed its original effort, USEC has gained momentum and has met or exceeded the milestones spelled out in its cooperative agreement with DOE. Many challenges lie ahead, both technical and financial, but USEC's lack of alternatives ensures that the company is strongly motivated to make the centrifuge program a success.

Q4 2002 **Russia's Enrichment Sector In A New Century**
The essay examines Russia's centrifuge-based enrichment industry and how it is adapted to changes both in Russia and in its access to world markets since the collapse of the Soviet Union. It also discusses some of the innovative approaches that the industry has developed to optimize its operations given the trade restrictions and its excess capacity.

Q3 2002 **The Enrichment Market in Asia**
This essay takes a look at the fastest growing and most open market for enrichment, but one that is also plagued by near-term problems. Developments in this market will nonetheless have important ramifications for future enrichment market in general, as what happens here will affect buyers and sellers alike.

Q2 2002 **The U.S. Government and the Enrichment Business**
This essay examines objectives in the recent agreement it signed with USEC, its approach to achieving these objectives, and the potential results. This essay also briefly reviews the implications of the recent arms reduction treaty, which also largely comes under DOE's purview.

Q1 2002 **Trade Orders-Processes, Procedures, and Impacts**
This essay examines the antidumping and countervailing duties now imposed on European enrichment services. It addresses questions such as how the duties are applied, details the various reviews to which the duties are subject, presents the appeal and challenge process, and discusses how the market impact of the duties from both specific and general perspectives.

Q4 2001 **LES-II**
This issue's essay, "LES-II," examines the prospects for using Urenco technology for a new U.S. enrichment plant. Since LES represented an initial attempt to introduce Urenco technology to the U.S. and likely will serve as a model for a second attempt, this earlier effort is reviewed. Changes in the market, utility industry, institutional, and regulatory climate existing during that earlier effort and now are presented to help assess the likelihood for success of any new venture. Potential problems and other considerations are also addressed.

Q3 2001 **U.S. Centrifuge Program**
This essay examines the potential revival of the U.S. centrifuge program that was largely shuttered in 1985 when DOE opted for AVLIS over centrifuge technology. A complete history of the program is presented as background to this discussion.

Q2 2001 **Who's in Control?**
This essay deals with the various competitive advantages or strengths of various companies and groups in the enrichment market, besides the USEC and the U.S. government, which were examined in the previous essay. This examination provides an indication of how the market may be shaped as the different entities try to exert some measure of control.

Q1 2001 **Enrichment at a Crossroads**
Examines the changed prospects of the enrichment market based on developments that have occurred over the past year. The essay also looks at different paths the market could follow in the future and the key determinants that will influence this direction.

Q4 2000 **The Future Roll of European Enrichment Supply**
Examines the increasing importance of supplies from Cogema and Urenco in the marketplace. This examination addresses the Urenco ownership question and the recently filed USEC dumping case against Cogema and Urenco, as well as the role of exchange rates.

Q3 2000 **The Capacity Game**
Focuses on future enrichment capacity in light of USEC's decision to shut down Portsmouth and DOE's more recent decision to maintain part of Portsmouth's capacity on a "cold standby" basis. This examination considers the difference between nameplate and economic capacity, as well as capacity that is not presently available to the market but could be if developments change in the future.

Q2 2000 **The Future of SWU Supply**
An examination of ongoing developments that could shape the nature of SWU supply for years to come, including the ownership of Urenco, negotiations for an extension of the HEU deal, Congressional hearings on USEC, and the ITC investigation in the sunset review. Broader implications for the market that are likely to stem from these developments are also reviewed.

Q1 2000 **USEC's Viability in Question**
A look at the growing concern over USEC's viability, the conditions that led to this concern, and potential future developments if USEC's viability remains an issue. This examination follows the essay in the last report that investigated USEC's technology options moving into the next millenium.

Q4 1999 **USEC at a Strategic Crossroads**
An examination of USEC's post-privatization situation that investigates the company's technology options moving into the next millenium. The essay highlights USEC's need to reduce production costs and develop a new technology in order to remain a viable long-term supplier.

Q3 1999 **The Return of the EUP Market**
A review of the trends in the EUP market, starting in 1994 when the first wave of long-term EUP deals was done. This essay also provides insight into utility attitudes toward buying EUP based on surveys conducted in 1994 and 1999.

Q2 1999 **The HEU Feed Deal - Implications for Russian Enrichment**
The implications of the HEU feed deal for Russian enrichment are presented by examining the technical aspects of HEU blending and accommodations made in the deal which allow the Russians to receive a credit for equivalent feed used in the blending process.

Q4 1998	**Enrichment Technology and Capability Review** A review of enrichment technologies and capabilities of the primary enrichers. With enrichers now apparently driven more by market share considerations, current technology and future choices in technology will play an important role in determining market allocation and price.

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