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UxC Update

January 2022

A periodic newsletter to keep our clients up-to-date on developments within our company

As we start the new year, all of us at UxC hope that our friends and clients are staying safe and healthy. The past year remained challenging as the world continued to deal with COVID-19 along with various other headwinds. However, the nuclear markets have kept going strong, and we have seen numerous positive developments for global nuclear power that make us optimistic about the future of the nuclear industry.

The following update presents company accomplishments over the course of 2021 as well as some of our plans for 2022.

Message From UxC President Jonathan Hinze



The world has been forever altered by the long-lasting COVID-19 pandemic, but I am proud to say that UxC has been able to weather the storm and continue to provide the highest quality products and services to support the global nuclear markets over the past two years without missing a beat. I believe this is a testament to the dedication and hard work that the entire UxC team brings each and every day to ensure that the industry has a timely and unbiased source of hard-hitting analysis, accurate data, and useful information in an easy-to-use, accessible format. The nuclear market is clearly going through a period of significant transition as we are well past the aftereffects of Fukushima over a decade ago. I am equally convinced that the next five years will be critical in determining the future direction of nuclear power and the nuclear fuel markets. With this in mind, UxC will remain a thought leader for the industry as we embark on this new and exciting path together.

I wish all our clients a successful 2022, and I look forward to seeing many of you in person at an industry event in the not-too-distant future.

UxC Nuclear Fuel Training Seminars

UxC successfully held its latest in-person Nuclear Fuel Training Seminar in Vienna, Austria last October. This was the first time we held our seminar in Vienna, and it was one of the first in-person nuclear fuel market events since the start of COVID. Despite the unique challenges presented by the pandemic, there was interest to participate from across the globe. Ultimately, we were able to gather 27 participants from 13 different countries from Europe, Central Asia, and the Middle East for three days of intensive nuclear fuel market educational sessions along with various lively networking opportunities.

We are also excited to announce that we will be holding our next Nuclear Fuel Training Seminar in Atlanta, Georgia, USA on June 27-30, 2022. The seminar will be held at the Intercontinental Buckhead Hotel. This is our first Atlanta seminar since June 2019, and we look forward to welcoming participants from across the globe to what has become a premier nuclear industry event. Registration will open soon, so please save the date!

For additional information regarding the June 2022 seminar in Atlanta, please contact Eric Webb, Executive Vice President, Commerce & Data.

UxC Client Webinars



UxC continued to provide additional content and insights to its global clientele via several webinars over the course of 2021. These webinars - one in January and another in October - were provided at no additional charge to all *Ux Weekly*



subscribers. Each webinar included in-depth presentations on key trends affecting the nuclear power and fuel markets as well as a lively Q&A session.

These webinars were held free for all active subscribers to the respective reports. Subscribers can click [here](#) to access past webinars, and non-subscribers can click [here](#) to learn more about UxC's webinars.

UxC is also planning additional webinars for 2022 with the next webinar again open to all *Ux Weekly* subscribers tentatively set for Thursday, February 10 at 9:00 am EST. Please stay tuned for an official email with further information, including a registration link.

Speeches, Articles, and Achievements by UxC Personnel



UxC experts were also quite busy over the past year contributing to various industry publications, events as well as offering our expertise to institutes of higher learning.

Jeff Combs, Chairman and Owner, together with **Lydia Hsieh**, Special Consultant, authored a paper on the topic of "Enrichment's Critical Role in Nuclear Fuel Supplies" published in the Q1 2021 edition of the *International Association for Energy Economics (IAEE) Energy Forum* journal.

Jonathan Hinze, President, presented a paper on the topic of "UxC Daily Spot Price Reporting in Response to an Evolving Market" during NEI's International Uranium Fuel Seminar (IUFS) held in Savannah, Georgia, USA in November 2021. Also, as a sign of the increasing global interest in the nuclear fuel and power markets, Jonathan was interviewed by numerous media outlets over the past year, including a TV appearance on *BNN Bloomberg*, as well as for articles published by the *Wall Street Journal*, *New York Times*, *MarketWatch*, *Barron's*, *Bloomberg*, *The Economist*, *Financial Times*, *The Telegraph*, *Globe & Mail*, *CNBC*, *Deutsche Welle*, *The Market/NZZ*, *S&P Global Intelligence*, and *Utility Dive*.

Nick Carter, Executive Vice President, Uranium, gave multiple presentations in 2021, including on "Uranium in Transition" at the PDAC 2021 virtual event in March, on "The Emerging Production Cost Gap" at the AusIMM Digital Uranium Conference

in August, a keynote speech during the TD Securities Virtual Uranium Roundtable in October, and a "Uranium Market Overview" for an OECD-NEA/IAEA Uranium Group virtual meeting in November.

Anna Bryndza, Executive Vice President, International, who is currently serving a two-year term as Chairperson of the WNA's Fuel Cycle Members Forum (FCMF), chaired three online versions of the FCMF in January, April, and September 2021. These sessions were highlighted by panel discussions on the current state and outlook for the uranium and conversion markets featuring key market participants, including UxC's Jonathan Hinze. The next FCMF will be held virtually on January 19, 2022. Anna was also interviewed in late 2021 for an extensive article on the uranium market published by Russia's Interfax news agency, and she presented to a group of students at the University of Texas - Austin discussing the tremendous value of the nuclear industry in the global energy mix.

Carlyn Greene, Senior Vice President, Spent Fuel, published an article on the topic of "Global Spent Fuel Overview" in the Winter 2021 edition of the ASQ Energy and Environmental Division newsletter. Carlyn's article was based on information originally published in UxC's SpentFUEL and StoreFUEL back-end publications.

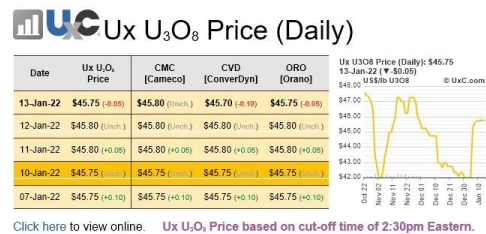
UxC Video During WNFM Virtual Meeting

During the World Nuclear Fuel Market (WNFM) annual meeting, which was held virtually in June 2021, UxC presented a video showcasing its latest activities about how we have adapted to the evolving market conditions amid the COVID-19 pandemic. For those who were unable to join the WNFM meeting, UxC's video can be viewed here.



UxC Introduces Daily Ux U₃O₈ Price[®]

In response to the rapidly changing spot uranium market, UxC announced in September 2021 that it was transitioning away from the former Broker Average Price (BAP) to a daily Ux U₃O₈ Price, which has been the industry's leading spot uranium price indicator since 1987. In addition to shifting to daily price reporting, UxC also started reporting daily prices for delivery at the three western converters (Cameco, ConverDyn, and Orano).



More information on the *Ux Weekly* and UxC's nuclear fuel price indicators, including the daily Ux U₃O₈ Price, can be found here.

Latest Nuclear Market Outlooks

At the end of 2021, UxC again published updated issues of all its standard *Market Outlook* reports covering the various aspects of the nuclear fuel cycle.

In addition to presenting our latest nuclear power forecast scenarios through 2040 and other detailed reactor market data and country updates, our Q4 2021 *Nuclear Power Outlook* (NPO) included an in-depth discussion of the major trends in nuclear power by country and region over the past year. Over the course of 2021, the NPO delved into numerous other important nuclear power topics, including the outlook for SMRs and advanced reactors, the impact of China's 14th Five Year Plan,

recent actions by governments in Central and Eastern Europe to advance new build projects, as well as an in-depth look at the emerging nuclear hydrogen market. The *UxC Requirements Model* (URM) reports that accompany each NPO also present the output of our quarterly modeling for future nuclear fuel component requirements through 2040.



UxC's *Uranium Market Outlook* (UMO) Q3 2021 report included an essay titled "Meeting Tomorrow's Supply Deficits," that analyzes the queuing of potential primary production that could be brought online to meet projected future uranium supply deficits. The most recent Q4 UMO included an essay on "What Advanced & Small Reactors Mean for Uranium," which reviews major developments associated with advanced reactors (AR) and small modular reactors (SMR) in key countries around the world and offers a potential range of future uranium demand for AR/SMRs. All our UMO reports present updated uranium supply and demand forecasts, contracting activity, market trends, and spot and long-term price forecasts.



The latest *Conversion Market Outlook* (CMO) report, issued in December 2021, included an essay entitled "Crystal Ball Glimpse: The Conversion Market in 2030," which makes a number of predictions and observations about the likely direction of the conversion market and how it might evolve through the end of this decade. Each CMO report also analyzes all aspects of the constantly evolving UF₆ market, including supply and demand fundamentals, contracting activity, market trends, as well as spot and long-term price forecasts.



In our Q3 *Enrichment Market Outlook* (EMO) report, we presented an essay on "Projecting Future Average SWU Delivery Prices" that highlights the evolution of SWU delivery prices paid by utilities over the years and presents UxC's modeled projections for SWU delivery price trends. The most recent Q4 EMO included an essay on "Risky Business: Trade & (Geo)Politics of SWU" examining how geopolitical and trade issues in recent years have disproportionately impacted the enrichment market and how some potential high impact, low probability future events could have severe consequence for the enrichment market. Each EMO report also presents updates on the latest SWU market developments, including supply and demand forecasts, contracting activity, and long-term price forecasts.



In August 2021, UxC issued its annual *Fabrication Market Outlook* (FMO), which presents detailed information and analysis on the global fabrication markets, including the latest contracting activity, market trends, supplier profiles, supply and demand dynamics as well as LWR fuel price forecasts. The 2021 essay, titled "Impacts from Unique Reactor Operating Issues," examines the various effects on the fabrication industry from non-standard reactor operating conditions. This includes a discussion of recent and anticipated future trends and their impacts on fabrication from such reactor conditions as new reactor first cores, extended outages and reactor restart cores, final cores for retiring reactors, and unused fuel from canceled or abruptly closed reactors.



UxC's *Policy Watch* reporting service over the past year was also packed with new research and analysis on all the latest policy developments affecting the nuclear markets. Some of the key policy issues covered in *Policy Watch* in 2021 were the approach to climate change and nuclear power policies by the new Biden Administration, U.S. state policies to preserve nuclear plants, the first year implementation of the amended Russian Suspension Agreement, the state of Iran-related sanctions, developments with the U.S. Uranium Reserve, implications from China's new nuclear energy policies laid out in its 14th Five Year Plan, the debate over nuclear power in Europe, including the inclusion of nuclear in the EU's green finance taxonomy, Japan's new government and policies on nuclear power, and energy policies in India, France, South Korea, Netherlands, Belgium, UK, and Taiwan, among many other topics.

As always, all UxC *Market Outlook* reports are available as part of our subscription packages.

Recent and Upcoming Special Reports

UxC's special reports are designed to complement our *Market Outlook* reports by examining key topics in greater depth. The following are some of our most recent and upcoming special reports.

Special reports published in 2021:



Nuclear Zirconium Alloy Market—Nuclear-grade zirconium alloys and products are used in the fabrication of nuclear fuel assemblies for the vast majority of current and future reactor designs. UxC published its eighth edition of this special report in April 2021, which provides updated analysis of the various sectors that make up the nuclear-grade zirconium sponge, alloy, component, and tubing markets. Using proprietary demand modeling and other unique research results, we identify the latest major trends in this industry by analyzing the global and regional supply and demand balances for nuclear-grade zirconium sponge, alloy, and tubing as well as the supply and demand situation based on reactor fuel types.



Uranium Production Cost Study (UPCS)—UxC issued the sixth edition of this biennial report on uranium production costs in August 2021. The UPCS complements the *Uranium Suppliers Annual* and provides production cost curves for operational, planned, and potential uranium projects to identify where expanded and new uranium supply will come from among over 100 worldwide projects to meet future nuclear fuel demand through 2035. Production cost curves for individual projects are presented by geographic region and mining method. An extensive review of various factors impacting production costs is also detailed in the new 2021 UPCS.



Uranium Suppliers Annual (USA)—In December 2021, UxC released its latest *Uranium Suppliers Annual*, which contains comprehensive data and information on all the world's uranium suppliers, including detailed sections on planned producers, junior/exploration companies, and intermediaries. Included in the USA are future production forecasts, operational considerations, supplier/project risk analyses, production cost estimates, mill capacities, project reserves, and supplier/facility summaries. The USA also examines supplier marketing strategies, allowing buyers to understand the capabilities and motivations of suppliers, as well as the political, social, and economic environments in which they operate.



Conversion & Enrichment Supplier Assessments (CESA)—In December 2021, UxC issued the second annual edition of the CESA report, which provides profiles of each supplier in the conversion and enrichment markets as well as unbiased, quantitative evaluations of the major conversion and enrichment suppliers through a detailed risk matrix approach. CESA allows utilities to compare each of their suppliers and gauge the relevant risks within their current and potential future supply portfolios. For suppliers, investors, and others active or interested in following conversion and/or enrichment supply, CESA provides an independent and unique evaluation methodology to identify how each supplier ranks within the current fuel cycle market.

Upcoming special reports in 2022:



Global Nuclear Fuel Inventories (GNFI)—UxC will be publishing the fourth edition of a special report on Global Nuclear Fuel Inventories in mid-2022. The new GNFI report will include further enhancements over previous editions and provide the latest information and insights related to nuclear fuel inventories around the world, including updated data and analysis of all utility, supplier, trader/financial, and government inventory levels, plus new insights into the level of utility forward coverage rates and their evolution in the coming years. The GNFI also contains

forecasts for future inventory buying and disposition as well as a look at inventory policy impacts on the uranium, conversion, and enrichment sectors. Plus, the GNFI includes analysis of the market impacts of inventories and key considerations for all market entities.



Small, Advanced, and Micro Reactor Assessments (SAMRA)—UxC has been at the leading edge of analyzing innovative small modular reactor (SMR) designs and their market potential, including through two major reports issued in 2010 and 2013 along with ongoing detailed coverage in many UxC reports since then. UxC’s team of nuclear reactor market experts is now working on a new special report that specifically assesses the global landscape of small, advanced, and micro reactors. This new SAMRA report, which is targeted for publication in the first half of 2022, will include profiles and evaluations of all leading advanced reactor designs, a detailed market analysis of how advanced reactors can fit into the future energy mix, global forecasts for these advanced technologies, along with critical discussions on the outlook for this emerging market through 2050.

Virtual Atomic Runners

As most nuclear conferences were again held virtually in 2021, UxC organized its second annual Virtual 5K run last June with our industry friends in the Atomic Runners group. The 2021 event saw 225 km covered across 10 countries, which was more than double the total from the inaugural 2020 event. Participants sent pictures and comments to UxC, which we published in the June 21st edition of our *Ux Weekly* newsletter. Photos submitted by all our Virtual 5K participants can be found [here](#).



We were also glad to see the Atomic Runners return to a live group run in Savannah, GA during the NEI IUFS in November. However, since not everyone is able to make industry conferences these days, UxC intends to make the annual UxC 5K run an annual event. Please contact Anna Bryndza if you want more information on the Atomic Runners

running group.

UxC Rejoins Twitter

Given surging interest in uranium and other nuclear-related topics on social media in recent years, UxC determined in early 2021 that it was time to re-engage with the Twitterverse. @UxC_Nuclear has rapidly become a go-to resource for many looking for the latest updates on the nuclear/uranium markets, UxC developments, and other important news. UxC also aims to use its Twitter platform to expound on the virtues of nuclear power and to educate the broader public regarding important nuclear power and fuel market issues. For those who have yet to follow us on Twitter, now is your chance to get in on the act!



UxC is also active on LinkedIn, so please check out our posts there too.

UxC Working with Tellus Museum to Expand Nuclear Education

For several years, UxC has been a major sponsor of the Tellus Science Museum. Affiliated with the Smithsonian, Tellus is a world-class museum located in Cartersville, Georgia. Over the coming few years, UxC will be working with Tellus to incorporate the science and advantages of nuclear power into the museum's exhibits and educational content, potentially resulting in a permanent addition to the museum.



For more information on UxC activities and reports, please visit our website at www.uxc.com.