

2016 U₃O₈ Production Review

Worldwide uranium production continued to push higher in 2016, reaching 162 million pounds U₃O₈, which was 4 million pounds higher than 2015's 158 million pounds U₃O₈. Much of the production gain in 2016 came from the continued ramp-up of Cameco's majority-owned Cigar Lake mine in Saskatchewan, Canada, which increased production by 6 million pounds, as well as further increases from the ramp-up of newer in-situ recovery (ISR) mines in Kazakhstan. Additionally, Australia and Namibia had significant production gains in 2016 compared to 2015, which were partially offset by production declines in Niger, Ukraine, and the U.S. At this time last year, UxC projected 2016 world production would reside in a range of 159-161 million pounds, so the 4 million-pound increase marginally exceeded expectations, as UxC anticipated more production cuts would occur sooner.

UxC's URM Base Demand Case (including inventory build-up) totaled 190 million pounds U₃O₈ in 2016. With secondary supplies accounting for 46 million pounds U₃O₈ during the year, the addition of 2016 world production resulted in total supply of 208 million pounds U₃O₈, which is a supply surplus of 18 million pounds U₃O₈. This excess supply was the primary reason that the spot U₃O₈ price fell to \$18.00 per pound U₃O₈ late in 2016, and ultimately led to the announcement by Kazatomprom in January of this year to cut back Kazakh production by ~10% for 2017.

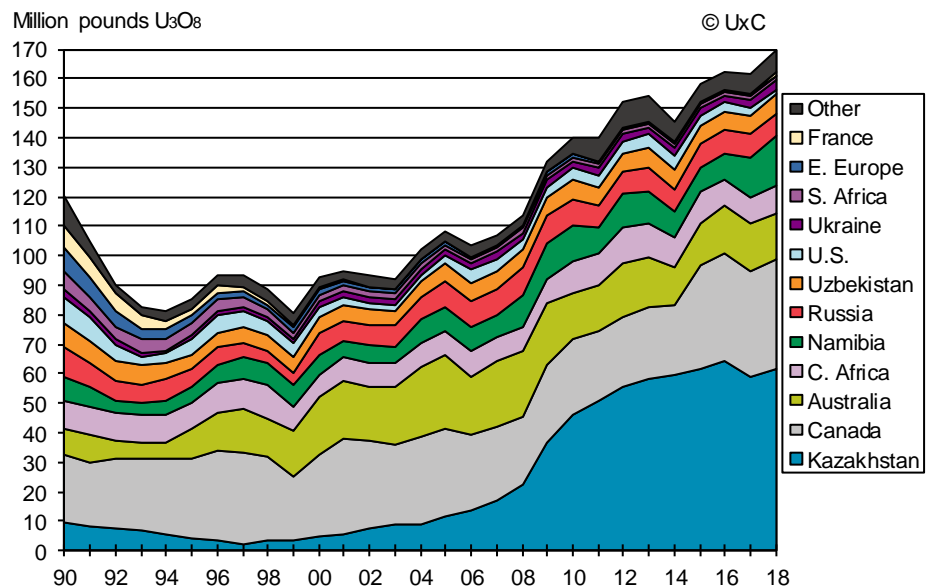
Kazakhstan had another record-breaking year as the world's largest uranium-producing country, accounting for nearly 64 million pounds U₃O₈ in 2016 and 40% of the world total. However, with the above-mentioned production cuts for 2017, Kazakh production is expected to slip to ~59 million pounds U₃O₈ this year.

AREVA's majority-owned KATCO joint venture (51% AREVA, 49% Kazatomprom) produced ~10.4 million pounds U₃O₈ from the Muyunkum/Tortkuduk deposits, which was slightly less than in 2015. At Cameco's majority-owned JV Inkai (60% Cameco, 40% Kazatomprom), production totaled nearly 6.0 million pounds U₃O₈, compared to 5.8 million pounds U₃O₈ in 2015. For 2017, JV Inkai

Ux Price Indicators					
Weekly Ux U₃O₈ Price[®] (4/24/17)		\$22.75 (-\$0.50)			
Ux 3-Yr U ₃ O ₈ Price \$27.00		Ux 5-Yr U ₃ O ₈ Price \$30.75			
Month-end (4/24/17) *Calculated values					
U ₃ O ₈	Spot	\$22.75	Conversion	NA Spot	\$5.50
	Spot MAP*	\$23.25		NA Term	\$13.00
	3-Yr Forward	\$27.00		EU Spot	\$6.00
	5-Yr Forward	\$30.75		EU Term	\$14.00
	Long-Term	\$31.00			
UF ₆ Spot	NA Price	\$64.00	SWU	Spot	\$47.00
	NA Value*	\$64.94		Long-Term	\$50.00
	EU Value*	\$65.44		EUP	NA Spot*
		NA Term*	\$1,272		

is targeting production of 5.5 million pounds U₃O₈ from blocks 1 and 2. Production from Karatau LLP's (50% Kazatomprom, 50% Uranium One) Budenovskoye 2 ISR mine was 5.4 million pounds U₃O₈, which was identical to 2015. The South Inkai ISR project, which is part of the Betpak Dala JV (70% Uranium One, 30% Kazatomprom), yielded 5.3 million pounds U₃O₈, which was also identical to 2015. The Akdala ISR project, also part of the Betpak Dala JV, produced 2.6 million pounds U₃O₈, which was 2% lower than in 2015. The Akbastau JV (50% Kazatomprom, 50% Uranium One) contin-

Uranium Production: Historical & Planned



ued to increase production to 4.6 million pounds U_3O_8 , compared to 4.3 million pounds U_3O_8 in 2015. Meanwhile, Zarechnoye JSC (49.98% Kazatomprom, 49.98% Uranium One, and 0.04% Kara Balta) processed almost 2.2 million pounds U_3O_8 , nearly equal to 2015.

Kazatomprom’s three 100%-owned ISR mining groups (Stepnoye, Taukent, and RU-6) yielded 7.9 million pounds U_3O_8 in 2016, which was 5% lower than in 2015. JV Kendala, which has an offtake agreement with Japan’s Itochu Corp., produced 5.2 million pounds U_3O_8 from the Central Mynkuduk ISR project in 2016, up 11% from 2015’s 4.7 million pounds U_3O_8 . Production from APPAK LLP’s (65% Kazatomprom, 25% Sumitomo Corp., and 10% Kansai Electric) Western Mynkuduk ISR project totaled 2.6 million pounds U_3O_8 , nearly identical to 2015. Production at Kharasan 1 (Kyzylkum LLP – 40% Energy Asia, 30% Kazatomprom, and 30% Uranium One) totaled almost 3.7 million pounds U_3O_8 , which was 26% higher than in 2015. At Kharasan 2 (Baiken U LLP – 95% Energy Asia, 5% Kazatomprom), production totaled 4.8 million pounds U_3O_8 in 2016. Sino-Kazakh Semizbai U LLP (51% Kazatomprom, 49% CGN) produced 3.3 million pounds U_3O_8 in 2016 from the Semizbai and Irkol ISR projects.

Canada once again claimed the second spot among uranium-producing countries in 2016, accounting for 36.5 million pounds U_3O_8 , or 5% higher than 2015’s 34.6 million pounds U_3O_8 . Canadian uranium production made up 23% of the global total. The country’s production gain came exclusively from the continued ramp-up of Cameco’s majority-owned Cigar Lake underground mine, where production jumped to 17.3 million pounds U_3O_8 in 2016 from 11.3 million pounds U_3O_8 in 2015. For 2017, Cigar Lake is expected to produce at its full nominal capacity of 18 million pounds U_3O_8 . Cameco’s majority-owned McArthur River/Key Lake

project remained the largest conventional project, but production fell to 18.1 million pounds U_3O_8 in 2016, compared to 19.1 million pounds U_3O_8 in 2015, following a decision last April to cut 2016 targeted production at the mine in response to lower prices. For 2017, Cameco is targeting 18 million pounds U_3O_8 for McArthur River/Key Lake. Cameco’s 100%-owned Rabbit Lake project recovered 1.1 million pounds U_3O_8 in 2016 and is currently on care and maintenance due to weak market conditions.

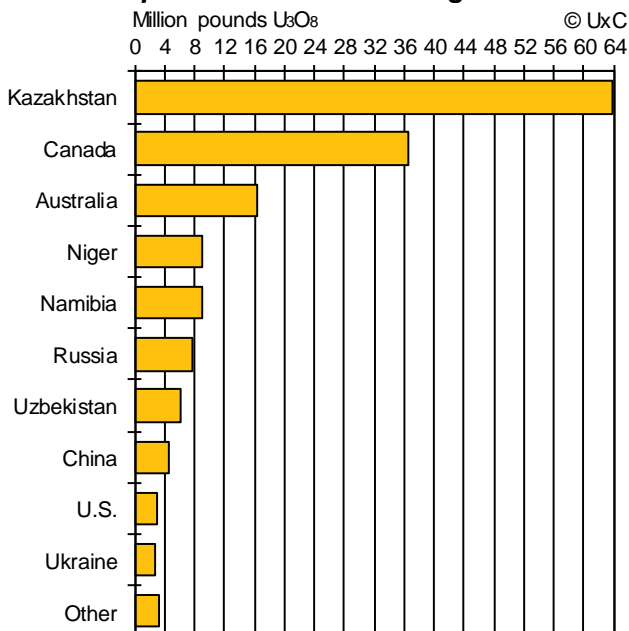
Australia maintained its “bronze” status again in 2016, while increasing production by 1.6 million pounds U_3O_8 to 16.3 million pounds U_3O_8 , accounting for 10% of global output. BHP Billiton’s Olympic Dam mine in Roxby Downs, South Australia, produced 8.3 million pounds U_3O_8 in 2016 despite a severe storm in Q3 that impacted production for several weeks. Production from lower-grade stockpiled ore at the Rio Tinto/Energy Resources of Australia (ERA) Ranger project in the Northern Territory totaled 5.2 million pounds U_3O_8 in 2016, which was 17% higher than production of 4.4 million pounds U_3O_8 in 2015. For 2017, ERA expects Ranger production to be in a range of 4.4-5.3 million pounds U_3O_8 . The other significant contributor to higher Australian production in 2016 was Quasar Resources’ 100%-owned Four Mile ISR project in South Australia, which produced 2.8 million pounds U_3O_8 , up 35% from 2015 as it continued to ramp up to full production capacity.

Niger barely hung on to the fourth spot in 2016, as production slid to 9.1 million pounds U_3O_8 from 10.8 million pounds U_3O_8 in 2015 due to current weak market conditions. Niger’s share of global production declined from nearly 7% in 2015 to less than 6% in 2016. AREVA’s SOMAÏR (Arlit) open pit mine produced 5.6 million pounds U_3O_8 , which was 14% lower than 2015 production of 6.5 million pounds U_3O_8 . AREVA’s majority-owned COMINAK (Akouta) underground mine extracted 3.4 million pounds U_3O_8 in 2016, which was 18% lower than 2015 production of 4.2 million pounds U_3O_8 . UxC expects a similar production level to be sustained in Niger for 2017 as uranium prices remain depressed.

Namibia produced 9.0 million pounds U_3O_8 in 2016, compared to output of 7.8 million pound U_3O_8 in 2015, and moved ahead of Russia to reclaim its position as the fifth largest uranium producing country, accounting for nearly 6% of global production. Paladin Energy’s Langer Heinrich open pit mine produced 4.9 million pounds U_3O_8 in 2016, which was 2% lower than in 2015. Rio Tinto’s majority-owned Rössing open pit mine yielded 4.1 million pounds U_3O_8 in 2016, up 48% from 2015’s 2.7 million pounds U_3O_8 . Although Swakop Uranium Ltd. reportedly produced its first drum of uranium from the Husab project on December 30, 2016, UxC expects Husab will produce up to 5 million pounds U_3O_8 in 2017, with a goal of reaching its nominal capacity of 15 million pounds U_3O_8 per year by 2019.

In South Africa, UxC estimates that AngloGold Ashanti

2016 Top 10 Uranium Producing Countries



produced 0.9 million pounds U_3O_8 from its Vaal River operation in 2016. In mid-July 2016, Sibanye Gold announced the closure of its Cooke 4 operation (formerly Ezulwini) in South Africa as it continued to fall short of production targets. The company reported production of 123,000 pounds U_3O_8 from Cooke 4 in 2016, compared to 122,000 pounds U_3O_8 in 2015.

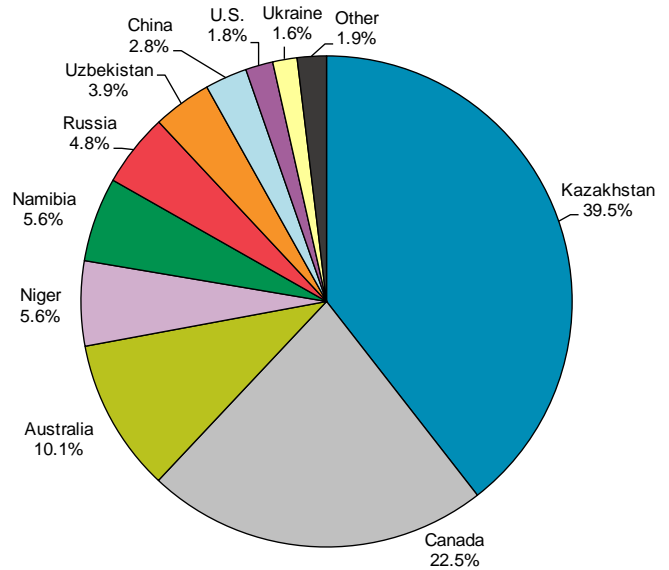
Russia slid to sixth position among uranium-producing countries in 2016, as it produced 7.8 million pounds U_3O_8 , compared to over 7.9 million pounds U_3O_8 in 2015. Russia's flagship Priargunsky underground mine (JSC PIMCU) produced 4.9 million pounds U_3O_8 , which was 5% lower than 2015's 5.1 million pounds U_3O_8 . In the Kurgan Region, the Dalur ISR mine produced over 1.5 million pounds U_3O_8 in 2016. Meanwhile, the Khiagda ISR mine increased its output to 1.4 million pounds U_3O_8 in 2016, compared to over 1.2 million pounds U_3O_8 in 2015.

Although official uranium production in **Uzbekistan** is considered a state secret, UxC estimates that the Navoi Mining and Metallurgical Combine (NMMC) processed 6.3 million pounds U_3O_8 from the Nurabad, Uchkuduk, and Zafarabad ISR mining divisions in 2016.

Ukraine's VostGOK yielded an estimated 2.6 million pounds U_3O_8 in 2016, compared to 3.1 million pounds U_3O_8 in 2015, as the company reported declining ore grades from the Ingulskaya and Smolinskaya underground mines.

U.S. production continued to dip in 2016, falling by 11% to 2.9 million pounds U_3O_8 from 3.3 million pounds U_3O_8 in 2015. Production from Cameco's Smith Ranch-Highland ISR project in Wyoming fell to 931,000 pounds U_3O_8 in 2016, compared to 1.4 million pounds U_3O_8 in 2015, as the company reported in April 2016 that new wellfield development would be halted for its U.S. ISR operations. Cameco's Crow Butte ISR operation in Nebraska yielded 232,000 pounds U_3O_8 in 2016, down from 395,000 pounds U_3O_8 in 2015. Uranium One's Willow Creek ISR project in Wyoming produced 59,900 pounds U_3O_8 in 2016, down from 117,300

2016 Production Shares by Country

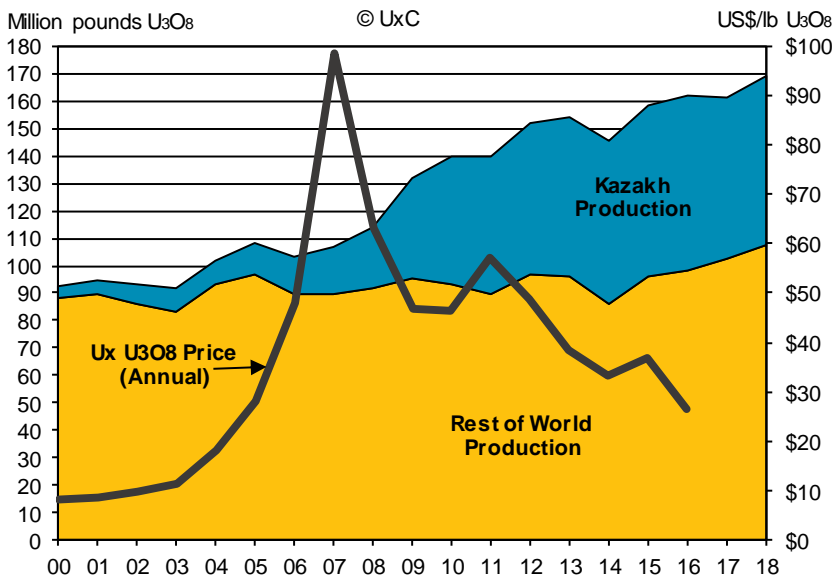


pounds U_3O_8 in 2015, as the existing wellfields are slowly nearing depletion. Ur-Energy extracted 561,000 pounds U_3O_8 from its Lost Creek ISR operation in Wyoming, down 23% from 727,000 pounds U_3O_8 in 2015 to more closely mirror contract commitments given the weaker uranium market. Peninsula Energy's new Lance ISR project in Wyoming produced 122,000 pounds U_3O_8 in 2016, as the project ramp-up has proven slower than expected and was hampered by inclement weather conditions in late 2016. Energy Fuels' Nichols Ranch ISR project in Wyoming recovered 335,000 pounds U_3O_8 in 2016, up 23% from 273,000 pounds U_3O_8 in 2015. For 2017, the company expects to produce 350,000 pounds U_3O_8 from Nichols Ranch. Energy Fuels' White Mesa mill in Blanding, Utah, the only operating conventional mill in the U.S., produced 680,000 pounds U_3O_8 in 2016, a 130% increase from 296,000 pounds U_3O_8 in 2015. Mill feed to White Mesa was comprised primarily of alternate feed materials and previously mined ore from the Pinenut mine in Arizona. For 2017, Energy Fuels expects to recover 450,000

pounds U_3O_8 at White Mesa, including ~300,000 pounds U_3O_8 from dissolved uranium not recovered from previous processing in the mill's tailings management system (pond returns) and ~150,000 pounds U_3O_8 from alternate feed materials.

2017 Outlook – Based on formal company production plans, 2017 worldwide production is expected to reside in a range of 160-163 million pounds U_3O_8 . The largest wildcard is how quickly Swakop Uranium Ltd. (CGN) ramps up production from its new Husab mine in Namibia, which is expected to produce up to 5 million pounds U_3O_8 in 2017. This new production will likely offset much of the expected 10% production decline from Kazakhstan in 2017. Perhaps the bigger question going forward is whether any other operating producers

Annual Ux U_3O_8 Price vs. Uranium Production



will step up to reduce higher-cost production amid uranium prices hanging in the low- to mid-\$20 range. Given the current downward pressure on uranium prices, UxC forecasts that additional production cuts will occur by year-end with 2017 world production likely ending in a range of 158-160 million pounds U₃O₈. Given projected demand of 190 million pounds U₃O₈ for 2017 and secondary supplies totaling 45 million pounds U₃O₈, a net surplus in the range of 13-15 million pounds U₃O₈ is anticipated.

News Briefs

Macron and Le Pen advance to runoff in French Presidential election

Centrist candidate Emmanuel Macron came in first place in the initial round of France's Presidential election yesterday (Sunday) with 24% of the vote, and far right candidate Marine Le Pen came in second place with 21.7% of the vote. Since neither candidate was able to earn a majority of the vote during the first round, a runoff election between Macron and Le Pen will be held on May 7.

Polls show that Macron leads Le Pen by an average of more than 25 percentage points going into the runoff, and he is widely expected to win election. Bookmakers have placed the odds of a Le Pen victory at about one in seven. Goldman Sachs has stated that it views the chances that Le Pen will ultimately become President of France as virtually zero. Most of France's political establishment, including Republican candidate Francois Fillon and Socialist candidate Benoit Hamon, have called for voters to back Macron in the runoff.

Macron supports the current Socialist party platform of closing the Fessenheim nuclear power plant in 2018 and reducing France's use of nuclear energy from the current level of about 75% of electricity generation to 50% of electricity generation by 2025, although he also acknowledges the crucial role of nuclear power for France's energy supply. Macron wants to replace lost nuclear capacity with renewable sources and has called for doubling the nation's renewable and solar capacity by 2022. In contrast, Le Pen opposes the closure of Fessenheim and wants to invest in the continued operation of reactors.

France will hold elections for its chief legislative body, the National Assembly on June 11 with a runoff election on June 18. These elections could be even more vital to the direction of the nation's nuclear energy policy going forward than the election of the President. Currently, the Socialist party controls the National Assembly, but it is highly likely that the party will lose control given its unpopularity and the weak fifth place finish of its candidate, Benoit Hamon, who only won 6.4% of the vote. Many of the more centrist Socialist legislators that currently hold seats in the National Assembly are likely to switch their allegiance to Macron's new centrist movement. However, as Macron's movement is relatively new, he will have to work with other parties in the National

Assembly in order to form a government. Thus, a strong showing by the pro-nuclear Republican party in National Assembly elections could provide a big boost to nuclear energy in France.

Saga Governor approves Genkai 3 & 4 restart

The Japan Times reported today (Monday) that Saga Prefecture Governor Yoshinori Yamaguchi approved the restart of Units 3 & 4 at the Genkai nuclear power plant on the island of Kyushu, Japan. With Governor Yamaguchi's consent, in addition to Prefectural Assembly approval gained last week, Kyushu Electric Power Co.'s Genkai 3 & 4 could return to service as early as this summer.

"After deeply thinking it over, as it was a grave decision to make, I have reached the conclusion that (the restart) is inevitable under the present circumstances," Governor Yamaguchi said. He added that Japan's dependence on nuclear power "cannot be helped to some extent" in terms of securing reliable energy supply.

In January 2017, Japan's Nuclear Regulation Authority (NRA) confirmed that Kyushu EPC's Genkai 3 & 4 are compatible with its new regulatory standards. The reactors must now pass a final safety inspection before resuming operations. Japan currently has three units online: Sendai 1 & 2 in Kago-shima and Ikata 3 in Ehime.

Japan nominates Fuketa for NRA Chairman

On April 18, *Reuters* reported that Japan's government has nominated Toyoshi Fuketa to be the next Chairman of the Nuclear Regulation Authority (NRA). Fuketa has been named as the successor of current NRA Chairman Shunichi Tanaka, who is retiring in September. Fuketa's appointment to NRA Chairman first requires confirmation by lawmakers. An unnamed government official also reported the nomination of Osaka University Executive Vice President Shinsuke Yamana to assume Fuketa's vacant NRA commissioner seat.

Fuketa was appointed a commissioner of the NRA in 2012. He is known for enforcing stringent safety reviews of Japan's reactors and has reportedly been vital to directing the cleanup effort ongoing at the Fukushima-Daiichi nuclear power plant. "Fuketa has a long background in research on reactor safety and replaces a figure (Tanaka) who was not seen as impartial, at least in some circles," said Andrew DeWit, a professor at Rikkyo University in Tokyo. "His appointment and international connections may help to overcome the industry's reluctance to adopt some internationally recognized safety practices," he said.

License renewal for Garona nuclear power in jeopardy

Iberdrola, which owns a 50% stake in the 470 megawatt Garona nuclear power plant in Spain, has expressed concern regarding the economic viability of investing the necessary upgrades to prolong the plant's lifespan. Garona is currently offline, and Spain's government has until August to decide

whether to allow the plant to reopen on the condition that extensive upgrades are carried out. Enel, the parent company of Garona's other 50% owner, Endesa, has stated that it will wait until the government makes a decision before making its own decision on whether to invest in upgrades. However, Iberdrola's reluctance to invest in Garona could lead to the Spanish government deciding against allowing the plant to restart. Iberdrola could decide to sell its share in the plant, but would likely face difficulty finding a buyer given the significant upgrade investments needed.

UK's Hinkley Point C project could face strike

Two labor unions representing workers at EDF's Hinkley Point C project in the UK have threatened to potentially strike over bonus payments. The unions plan to hold a consultative vote from May 2 to May 5 to evaluate the possibility of a strike. The unions claim that the proposed bonus payments offered by the construction consortium appointed by EDF is inadequate to attract the caliber of workers necessary to ensure Hinkley Point C is completed on schedule. EDF has stated that it is continuing negotiations with unions and its contractor in order to reach an agreement. If a strike were to occur it could lead to significant costs overruns and delays in construction. Full construction of two EPRs at Hinkley Point C has not yet commenced, but work on support structures is now underway. EDF hopes to produce the first electricity from Hinkley Point C in 2025.

Ohio legislators introduce bill to support nuclear energy

A bill now under consideration in Ohio would provide additional revenue for FirstEnergy to support the continued operation of the Davis Besse and Perry nuclear power plants, which otherwise face early retirement. The bill, which was introduced earlier this month in the Ohio Senate, could lead to rate increases that would be capped at around 5%, but it is unclear how much new revenue would be generated to support nuclear energy due to a complex formula involving plant emissions. FirstEnergy has stated that the bill is necessary to prevent early retirements of its nuclear power plants in Ohio, which currently generate about 14% of the state's electricity. It is not yet clear whether the bill will become law as significant opposition is expected.

U.S. Energy Secretary working to prevent early retirement of nuclear power plants

U.S. Energy Secretary Rick Perry has ordered an examination of the nation's electricity grid to determine whether policies now supporting wind and solar power are making early retirements of coal and nuclear power plants more likely. The review will last 60 days. Perry has directed his chief of staff to look into how regulations, tax policies, and renewable energy subsidies impact the early retirement for baseload power plants. A memo from Perry suggests that subsidies for renewable energy contribute to the closure of baseload power

plants. "Baseload power is necessary to a well-functioning grid," said the memo. "We are blessed as a nation to have an abundance of domestic energy resources, such as coal, natural gas, nuclear, and hydroelectric, all of which provide affordable baseload power and contribute to a stable, reliable, and resilient grid. Over the last few years, however, grid experts have expressed concerns about the erosion of critical baseload resources."

Matt Crozat, Senior Director of Policy Development for the Nuclear Energy Institute (NEI), stated that action is needed to avert the risk of more baseload power plants closing. "Competitive electricity markets are not producing price signals to stimulate investment in new generating capacity – with the exception of natural gas – or to support continued operation of existing power plants," said Crozat in an April 19 NEI news release. "By undervaluing nuclear power plants, current market policies and practices threaten the diversity of our nation's generating portfolio and our ability to meet environmental goals. We look forward to the agency's report on electricity markets and will continue to work with the administration to address these critical issues in U.S. electricity markets."

France's ASN defines preconditions for restarting AREVA's Creusot Forge plant

France's Nuclear Safety Authority (ASN) reported last week that it has defined the preconditions for restarting AREVA's Le Creusot Forge plant, which has been offline since December 2015 following the discovery of quality assurance issues. In a letter to AREVA, ASN noted that major technical and organizational dysfunctions persisted at the Le Creusot Forge plant over the past decades, and therefore must be corrected before the plant can return to service. ASN also said that it has carefully monitored developments regarding upgrades currently underway at Le Creusot Forge, conducting several inspections, meetings, and audits. Thus, ASN issued the following preconditions before AREVA may restart the Le Creusot Forge facility:

- Submit an updated action plan for the plant and update the regulator on its progress.
- Communicate the balance of all audits conducted to date.
- Verify that all ASN requests made during different inspections have been considered and completed.
- Maintain the safety culture of the Le Creusot Forge plant and its ability to manufacture components in accordance with applicable requirements.
- Conduct extended testing programs on components manufactured at the facility.
- Make public analyses and action plans as soon as they become available.

ASN concluded that prior to the restart of manufacturing at Le Creusot Forge, the regulator will check that all action plans are complete and maintain an increased oversight and monitoring program of the plant.

On April 7, 2015, ASN made public the discovery of an anomaly in the composition in certain zones of the vessel closure head and bottom of the Flamanville EPR reactor. This anomaly led ASN to ask AREVA and EDF to learn all possible lessons from this event, which culminated in manufacturing quality reviews on parts manufactured at the Le Creusot Forge plant, in addition to the search for similar anomalies and new monitoring programs to counter fraudulent documenting practices.

In late March, AREVA Director Bernard Fontana told the press that the company will not only ensure the foundry's procedures and quality are held to the highest standards but also plans to make investments at the plant so that it can manufacture large nuclear components, such as reactor containment vessels (*UxW31-14*, Apr. 3, 2017). Fontana added that Le Creusot Forge should be able to restart operations in summer 2017 following a series of upgrades.

Kazakh U production declines in Q1 2017

The Minister of Energy of the Republic of Kazakhstan, Kanat Bozumbaev, reported on April 18 that Kazakh uranium production has decreased. Speaking to the Cabinet, Bozumbaev indicated that Kazakh production in the first quarter of 2017 was 5,300 tU (~13.8 million pounds U_3O_8), a reduction of 12% compared to 6,000 tU (~15.6 million pounds U_3O_8) for the same period a year ago. In January, Kazatomprom and its partners decided to reduce Kazakh uranium production by approximately 10%, which would amount to more than 2,000 tU (~5.2 million pounds U_3O_8).

Rio Tinto reports Q1 2017 production

On April 20, Rio Tinto announced production results for the first quarter ended March 31, 2017 (Q1 2017). The company's majority-owned Rössing uranium mine in Namibia produced 981,000 pounds U_3O_8 on a 100% basis during Q1 2017, down 2% from Q1 2016. Rio Tinto said that the slight year-over-year decrease in Rössing production was attributable to slightly lower grades and recoveries at the mill. Rio Tinto holds a 68.6% share in Rössing, which yielded attributable production of 673,000 pounds U_3O_8 during Q1 2017.

At Energy Resources of Australia Ltd.'s (ERA) Ranger uranium mine in Northern Territory, Australia, production during Q1 2017 totaled 1,316,000 pounds U_3O_8 (100% basis), as ERA continues to process existing stockpiles. Ranger production during Q1 2017 was 1% higher than in Q1 2016. Rio Tinto owns a 68.4% stake in Ranger, which returned attributable production of 900,000 pounds U_3O_8 during Q1 2017.

Rio Tinto reported that its expected share of uranium production in 2017 is unchanged at 6.5-7.5 million pounds U_3O_8 . Rio Tinto Uranium (RTU), based in Singapore, markets 100% of production from Ranger and Rössing.

Paladin reports quarterly production totals

Paladin Energy Ltd. announced April 19 the release of the company's quarterly activities report for the period ending

March 31, 2017. At Paladin's Langer Heinrich uranium mine in Namibia, production and unit costs were impacted by a reduced mining plan. Therefore, March 2017 quarter production totaled 896,070 pounds U_3O_8 , which is down 26% from 1,206,685 pounds U_3O_8 produced during the quarter ended December 31, 2016. Paladin said that the reduction in quarterly production was mainly due to the 21% decrease in head grade associated with mining curtailment and a 7% decrease in ore processed due to lower process water availability caused by several NamWater and AREVA water supply interruptions and lower than expected tailings storage facility 3 water recoveries.

Paladin's C1 cash cost of production during the March 2017 quarter totaled \$21.02 per pound U_3O_8 , which is higher than the projected guidance of \$17-\$19 per pound. Yet, Langer Heinrich's C1 cash cost of production in the quarter was 13% lower than the corresponding March 2016 quarter.

Total sales for the March 2017 quarter were 730,642 pounds U_3O_8 at an average price of \$19.54 per pound, generating gross sales revenue of \$14.3 million. Sales volume for the March 2017 quarter was lower due to inventory accumulation for a major CNNC delivery, slated to be completed this month. Paladin expects uranium sales in the range of 1.1-1.3 million pounds U_3O_8 for the quarter ended June 30, 2017.

UPA asks DOE to halt further uranium transfers

The Uranium Producers of America (UPA), a national trade association representing the domestic uranium and conversion industry, last week submitted a response to the U.S. Department of Energy (DOE) request for comments to the Department's plan to issue a new Secretarial Determination covering potential continued transfers of uranium for cleanup services at the Portsmouth Gaseous Diffusion Plant. In its response to the DOE, the UPA said that, "The uranium and conversion industries are struggling to survive." The trade association said that DOE uranium transfers since 2011 "have clearly had an adverse material impact" on U.S. uranium producers and converters, thus forcing many of its members to cancel, halt, or reduce current and future projects.

In its letter, the UPA recommended that the DOE:

- Halt all transfers when the spot price is below the Energy Information Administration's (EIA) reported production cost (currently reported at \$35.45 per pound);
- Never transfer more uranium than the U.S. industry is producing;
- Work with Congress to pass legislation that establishes limits on excess uranium transfers;
- Downblend HEU in its inventory to higher enrichment levels of 5-20% U^{235} LEU for research and advanced reactor fuel;
- Work to develop a quantitative measure to define "an adverse material impact" consistent with the original intent of the USEC Privatization Act; and

- DOE should withdraw its 2016 Secretarial Determination, which was signed without public notice, comment, or review. Furthermore, LEU should not be bartered, exchanged, or sold into the commercial uranium market.

The UPA concluded that, "... The market needs time to recover and we need room in the market to compete. The DOE material is crowding out the market and accounting for nearly all the near-term uncommitted U.S. utility demand." More specifically, the UPA asked the DOE to first address three fundamental issues: DOE's refusal to define "adverse material impact" under the USEC Privatization Act; DOE's response to UPA's previous comments on the ConverDyn litigation; and the quality of the Energy Resources International (ERI) analysis of the potential effects of additional transfers on the domestic industry during calendar years 2017-2026. Finally, the UPA encouraged the DOE to bring together stakeholders to develop a long-term management plan for the future disposition of U.S. government uranium inventories.

Denison reports Gryphon D drilling at Wheeler River

On April 20, Denison Mines Corp. announced additional drill intersections from the Gryphon D series lenses, which are located outside of the Gryphon deposit at the greater Wheeler River uranium project in the eastern Athabasca Basin. Drilling returned 18.7 meters grading 1.9% U₃O₈ and 3.4 meters grading 3.1% U₃O₈. The D series lenses are not included in the current resource estimate for the Gryphon deposit and occur within 200 meters to the north and northwest of the Gryphon A, B, and C series lenses. Denison reported that mineralization located within the D series lenses remains open along strike to the northeast and southwest.

In addition, infill drilling within the Gryphon deposit's A, B, and C series lenses has continued under the winter 2017 drill campaign, returning highlights including: 7.1 meters grading 3.9% U₃O₈, 4.0 meters grading 3.8% U₃O₈, 6.2 meters grading 5.9% U₃O₈, and 3.6 meters grading 2.1% U₃O₈. This drilling at the A, B, and C lenses is designed to upgrade the current inferred resources of the Gryphon deposit to an indicated level of confidence by increasing the previous 50 x

50-meter drill spacing to an approximate 25 x 25-meter spacing. The program commenced in 2016, with the completion of an initial five drill holes. A further 17 drill holes, totaling approximately 8,402 meters, have been completed as part of the winter 2017 program, with a further 18 drill holes planned to be completed during the summer 2017 program.

The Wheeler River uranium project is located on the eastern margin of the Athabasca Basin in northern Saskatchewan. The project is being explored under a joint venture between Denison (60% and operator), Cameco Corp. (30%), and JCU (Canada) Exploration Company Limited (10%). The project is host to the Gryphon and Phoenix uranium deposits discovered by Denison in 2014 and 2008, respectively. The Gryphon deposit is hosted in basement rock and is estimated to contain inferred resources of 43.0 million pounds U₃O₈ at an average grade of 2.3% U₃O₈. The Phoenix unconformity deposit is located approximately 3 kilometers to the southeast of Gryphon and includes indicated resources of 70.2 million pounds U₃O₈ at an average grade of 19.1% U₃O₈.

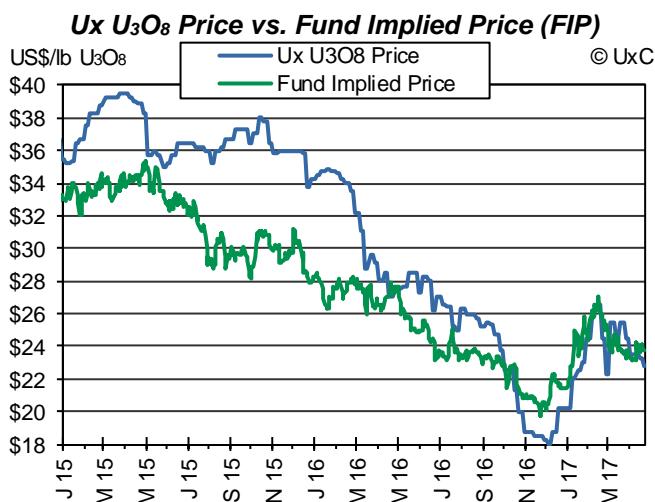
Fission reports PLS assays

Today (Monday), Fission Uranium Corp. announced assays from 16 holes drilled at the R840W and R1620E zones at its PLS uranium project in the western Athabasca Basin. Highlights from this batch of assays include: 51.0 meters grading 1.89% U₃O₈, 25.5 meters grading 2.39% U₃O₈, 6.0 meters grading 9.04% U₃O₈, and 20.0 meters grading 0.91% U₃O₈. Fission reported that this round of PLS drilling encountered mineralization in all 16 holes. Mineralization remains open along strike in both the western and eastern directions. The 31,039 hectare PLS project is 100%-owned and operated by Fission Uranium Corp.

Marenica Energy completes scoping study

Marenica Energy Ltd. reported April 18 that an independent scoping study has been completed on its Marenica uranium project in Namibia. The study was commissioned to determine if a step change in CAPEX and OPEX is possible by using the company's *U-pgrade* technology and a more flexible operating strategy utilizing the latest mining technology.

In January 2017, the company engaged DRA and Oreology to complete the Marenica uranium project scoping study. The study utilized project resources of 61.0 million pounds U₃O₈ at 0.0093% U₃O₈ and a 0.005% U₃O₈ cut-off grade. After applying parameters from the proprietary *U-pgrade* process, the company reported that the scoping study "significantly reduced development prices" at Marenica. However, Marenica reported no actual production costs or schedules. Marenica did say that the study's preliminary development schedule indicates that the project can be operational within three years from the commencement of the Pre-Feasibility Study (PFS). To that end, the company said that the Marenica uranium project will be viable at "a moderately higher uranium price," and it intends to commence on a more detailed PFS in 2018.



The Market

Uranium Spot & Forward Market

Over the past three weeks, spot uranium activity has declined notably, even lower than one normally witnesses in April leading up to this week's World Nuclear Fuel Cycle meetings in Toronto. That is not to say that there is no utility demand. A non-U.S. utility is finalizing its evaluation of offers for UF₆ with delivery in January 2018 for up to 300,000 kgU (about 780,000 pounds U₃O₈ equivalent). A second non-U.S. utility is evaluating offers for EUP (or as a U₃O₈ option) involving just over 200,000 pounds U₃O₈e with third quarter of 2017 delivery. A couple of other utilities are also seeking offers for spot delivery of U₃O₈ later this year. But even with several utilities interested at current price levels, there have been no utility purchases reported thus far for the month. In addition, intermediary activity has fallen off dramatically.

Even recent term demand has done little in the way to spark much new activity in the spot market. As such, offers over the past two weeks have once again started to slip as sellers are testing the waters in hope of finding buying demand. Based on recent activity as well as current bids and offers, the Ux U₃O₈ Price slips to \$22.75 per pound, down \$0.50 for the week, and down \$1.75 for the month. With this latest decline, the Ux U₃O₈ Monthly Average Price (MAP) for March comes out at \$23.25 per pound. The Ux 3-Year and 5-Year U₃O₈ Forward Prices also decrease this week to \$27.00 and \$30.75 per pound, respectively (see chart on page 11).

UxC Broker Average Price

The UxC Broker Average Price (BAP) began the week on Tuesday down \$0.32 to \$23.12. After finding some equilibrium at \$23.06 over the next two days, the midpoint slipped

by week's end on Friday to \$22.94, down \$0.12 on the day. Today's UxC BAP is \$22.75, down \$0.19 from Friday and down \$0.69 from last Monday's \$23.44. The BA Bid is \$22.50, down \$0.50 from last week's \$23.00 and the BA Offer is \$23.00, down \$0.88 from last Monday's \$23.88.

Fund Implied Price (FIP)

Fund Implied Prices (FIP) started the week on Tuesday down \$0.20 to \$23.67. The FIP gained to the low-\$24 range by Thursday, but turned over by \$0.24 to \$23.84 on Friday. Today's FIP is slightly lower at \$23.79, down \$0.05 on the day and down \$0.08 from last Monday's \$23.87. The latest FIP information can be found in the chart on page 7.

U₃O₈ Futures Market

The CME Group futures market for uranium picked up 200 contracts (50,000 pounds U₃O₈) for the October 2017 contract month in an over the counter deal at \$23.25 per pound. This transaction marks the first contracting activity in the month of April. Pricing during the week was largely negative as the strip lost an average of \$0.63. For the latest futures market prices, please refer to the table on page 11. With the week's addition of 200 contracts, the 2017 annum contract total increases to 2,494 contracts (623,500 pounds U₃O₈). Open interest increased by 200 contracts (50,000 pounds U₃O₈) with the week's contracting activity, and thus total open interest now stands at 4,516 contracts (1,129,000 pounds U₃O₈).

Uranium Term Market

While the term market is now moderately active, there has been little in the way of new reported base-escalated term offers, and what information has been collected results in no change in the Ux Long-Term (LT) U₃O₈ Price of \$31.00 per pound. A U.S. utility has offers due early next month for

UxC Market Statistics				
Monthly (Apr)	Spot		Term	
	Volume	# Deals	Volume	# Deals
U ₃ O ₈ e (million lbs)	0.5	5	0	0
Conv. (thousand kgU)	0	0	0	0
SWU (thousand SWU)	0	0	0	0
2017 Y-T-D				
	Spot		Term	
	Volume	# Deals	Volume	# Deals
U ₃ O ₈ e (million lbs)	10.0	75	28.0	11
Conv. (thousand kgU)	W	2	W	3
SWU (thousand SWU)	0	0	0	0

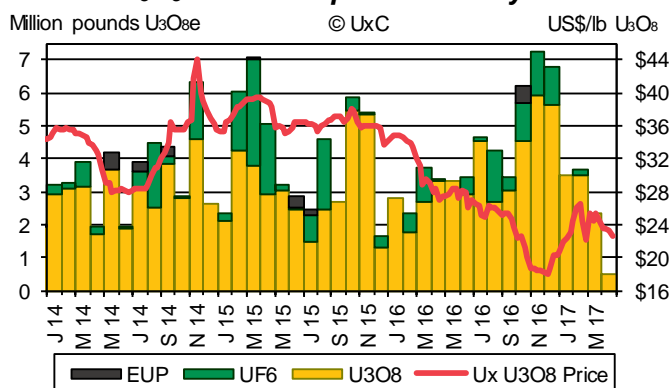
Key: N/A – Not available. W – Withheld due to client confidentiality.

UxC Leading Price Indicators

Three-month forward looking price indicators, with publication delayed one month. Readings as of March 2017.

Uranium (Range: -17 to +17)	-8 [unchanged]
Conversion (Range: -16 to +16)	0 [up 1 point]
Enrichment (Range: -18 to +18)	-9 [unchanged]
Platts Forward Uranium Indicator	\$22.25-\$23.50
A forward one-week outlook.	As of 4/24/17 (US\$/lb)

Ux U₃O₈ Price vs. Spot Volume by Form



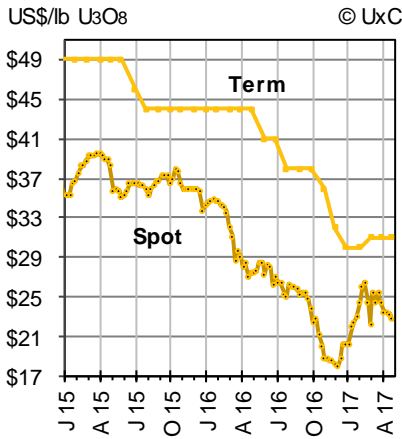
New Vice President

The chairman of the board of our company called me into his office to tell me the good news. I was being promoted to Vice President of Corporate Research and Planning. Of course, I was excited, but that didn't stop me from asking for my new title to be changed to Vice President of Corporate Planning and Research.

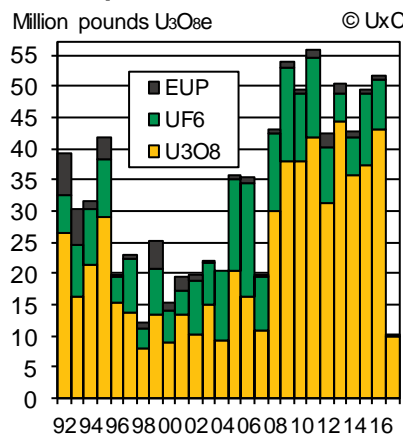
"Why?" asked the chairman.

"Because," I said, "our organization uses abbreviated job titles, and I don't want to be known as VP of CRAP."

Ux U₃O₈ Prices



Annual Spot Uranium Volumes



multiple forms with delivery in 2022-2024 plus optional years and volume totaling up to 1.8 million pounds U₃O₈e including options. A non-U.S. utility is out for up to 8.8 million pounds U₃O₈ with delivery in 2020-2029. Offers are due May 30. A non-U.S. utility that is out for EUP or its components with delivery in 2019-2023 (for about 2.3 million pounds U₃O₈e) and optional years of 2024-2028 (for a potential 3.6 million pounds U₃O₈ of additional quantity), has recently extended its due date for offers from April 26 to May 30. Another non-U.S. utility further extended its evaluation period for offers based on its mid-term request for just over 1.5 million pounds as U₃O₈ or contained in UF₆ with mid-term delivery in the 2020-2023 time period.

kgU, respectively. With demand levels for spot delivery remaining low, it is likely that the spot indicators will remain under downward pressure over the next couple of months.

Ux Price Indicators (€ Equiv[†])

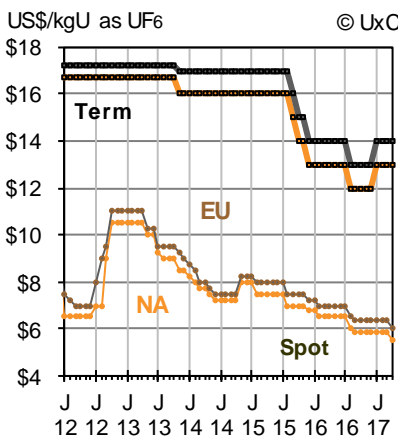
Weekly (4/24/17) 1 US\$ = .92029€		
Ux U₃O₈ Price	\$22.75	€20.94
Ux 3-Yr Forward	\$27.00	€24.85
Ux 5-Yr Forward	\$30.75	€28.30
Mth-end (4/24/17) 1 US\$ = .92029€		
U₃O₈	Spot	\$22.75 €20.94
	Spot MAP [†]	\$23.25 €21.40
	3-Yr Forward	\$27.00 €24.85
	5-Yr Forward	\$30.75 €28.30
	Long-Term	\$31.00 €28.53
Conversion	NA Spot	\$5.50 €5.06
	NA Term	\$13.00 €11.96
	EU Spot	\$6.00 €5.52
U₃O₈	EU Term	\$14.00 €12.88
	NA Price	\$64.00 €58.90
	NA Value*	\$64.94 €59.76
U₃O₈	EU Value*	\$65.44 €60.22
	Spot	\$47.00 €43.25
SWU	Long-Term	\$50.00 €46.01
	NA Spot**	\$ 956 € 880
EUP	NA Term**	\$1,272 €1,171

Conversion

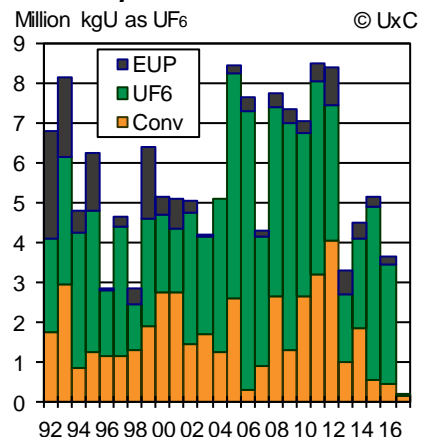
Spot conversion activity has been very limited since the beginning of the year, and no transactions or new demand were reported over the past week. Some activity has come to the market in the form of a couple of utility requests. A non-U.S. utility that was evaluating offers for 300,000 kgU as UF₆ with delivery in January 2018 is now reported as finalizing its selection. Another non-U.S. utility is evaluating offers for EUP or its components containing about 80,000 kgU as UF₆. Even with these requests and earlier reported renewed utility interest for spot conversion demand discussed over the past couple of months, only a couple of deals have been reported thus far for the year. And, current demand levels are once again very low. In the past, spot conversion sellers have been less likely to lower offer levels in order to entice new or additional demand. However, with more UF₆ inventory sources available to the market, and intermediaries wanting to access the U₃O₈ content, there has been some activity to move the stranded conversion component. As a result, renewed downward pressures on the spot price have been reported over the past month from multiple sources, and the spot Ux North American (NA) and European (EU) Conversion Prices have fallen to \$5.50 and \$6.00 per

While the spot market has continued to languish in both demand and price, there has been some new term activity and demand this year. There have also been reports of a range of award pricing based on several factors, including supply source, with some offers and activity around the \$16 level earlier this year. But as with the other components, competition still remains present in the market, and the Ux Long-Term (LT) NA and EU Conversion Prices are unchanged for the month at \$13.00 and \$14.00 per kgU, respectively. Currently active in the market is a U.S. utility that is out with a UF₆/conversion term request for delivery in 2022-2024, and with optional years, quantities could total up to 385,000 kgU as UF₆. A non-U.S. utility is awaiting offers due May 16 for up to four million kgU of conversion services with delivery in 2019-2023, or broken down into two- and three-year periods. Another non-U.S. utility has extended its offer due date from April 26 to May 30 for EUP or its components with delivery

Ux Conversion Prices



Annual Spot Conversion Volumes



in 2019-2023 and options through 2028. With options, quantities could total almost 2.3 million kgU as UF₆.

UF₆

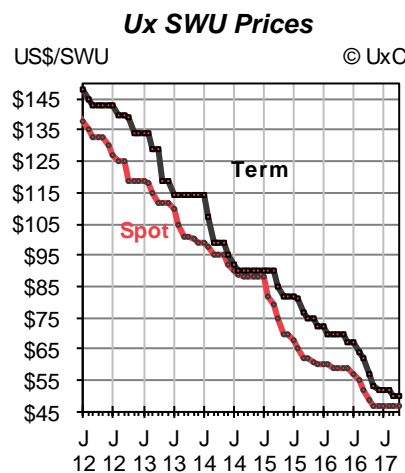
As with conversion spot activity, UF₆ demand is extremely low as noted in the active requests discussed above. Thus, it is not surprising to see that competitive UF₆ offers are tracking down the component prices with the Ux NA UF₆ Price falling \$5 for the month to \$64.00 per kgU. This decline slightly increases the discount off the component for UF₆ offers when compared to the calculated Ux NA UF₆ Value of \$64.94 per kgU. The Ux EU UF₆ Value comes in at \$65.44 per kgU.

Enrichment & EUP

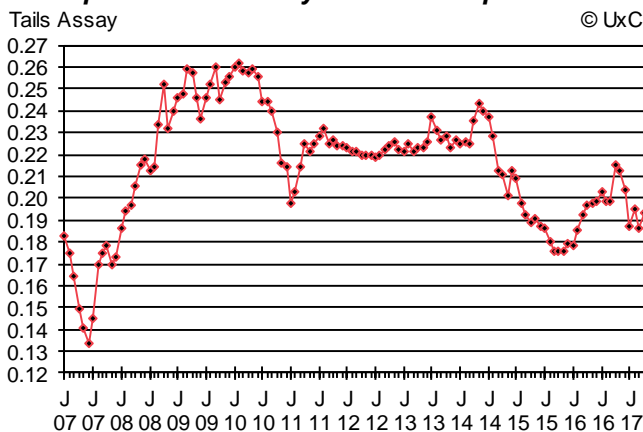
Activity in the spot enrichment market remains minimal, and while some other interest has been noted recently, only one utility is currently reported as active. No new demand or transactions have been reported over the past week. A non-U.S. utility is evaluating offers for third quarter delivery of enriched uranium product (EUP) or its components involving 50,000 SWU. With the continued limited demand and ample supplies, the spot market remains under downward price pressure. However, as overall activity is lacking, there have been fewer opportunities to discover new price points. And, suppliers have not been reported as being aggressive this year in lowering price offers to entice new demand. As a result, the spot Ux SWU Price remains unchanged for the month at \$47.00 per SWU.

Activity in the term enrichment market also remains limited with a single utility awaiting offers, and no new demand or contract awards were reported over the past week. Even the number of reports of unsolicited offers or other off-market activity have slowed over the past month. As such, after the term indicator slipped last month, the Ux Long-Term (LT) SWU Price is unchanged for April at \$50.00 per SWU. A non-U.S. utility is seeking term offers for EUP or its components with delivery in 2019-2023 (totaling just over 650,000 SWU) and options for 2024-2028 (adding one million SWU). The utility has extended the due time for offers from April 26 to May 30.

As both U₃O₈ and conversion prices fell this month and the SWU price remains unchanged, the optimal tails assay based on spot indicators increased slightly to 0.193%.



Optimal Tails Assays Based on Spot Prices



Calculated Enriched Uranium Product (EUP) Values at Various Tails Assays					
Current Optimal Tails: 0.193%					
Tails	0.15%	0.20%	0.25%	0.30%	0.35%
FtoP	7.754	8.415	9.219	10.219	11.496
StoP	8.801	7.690	6.871	6.231	5.710
EUP\$	\$917	\$908	\$922	\$956	\$1,015

Calculations based on Ux spot indicators using a 4.50% product assay.
 FtoP: Feed to Product ratio. StoP: SWU to Product ratio.
 EUP \$: US\$ per kgU of enriched UF₆.
 EUP \$ = (UF₆ Price * FtoP) + (SWU Price * StoP)

Ux Price Indicator Definitions

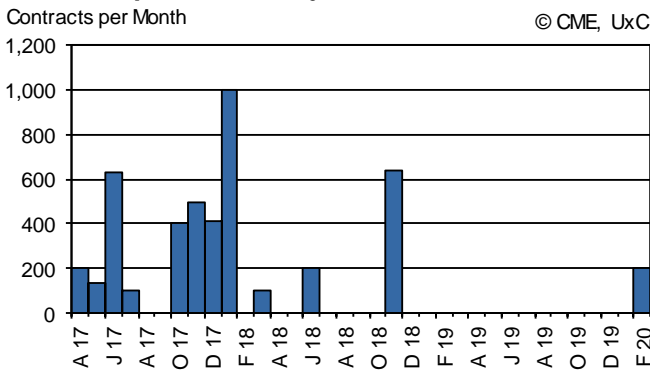
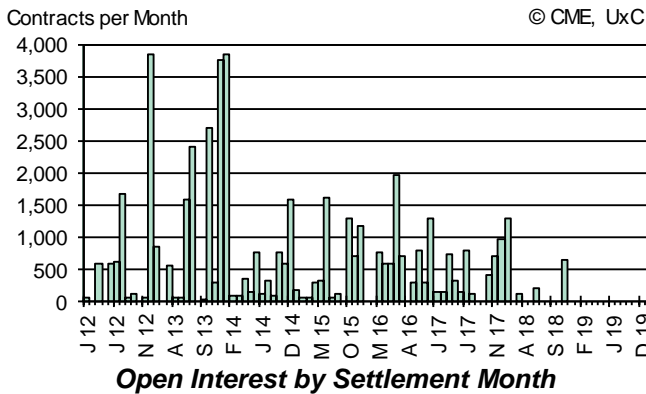
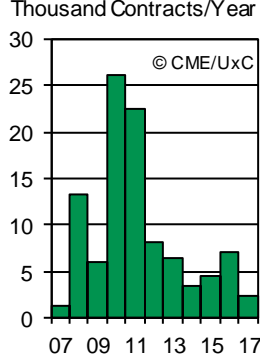
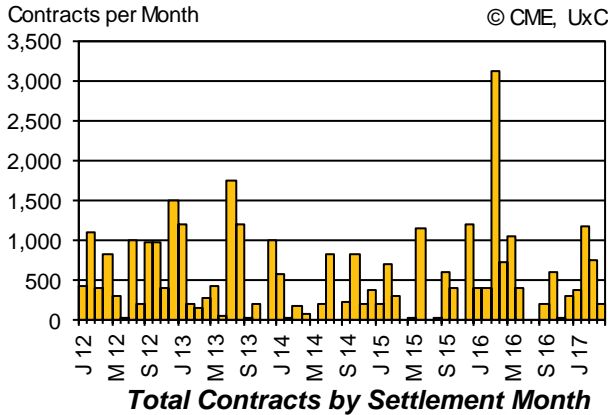
The Ux Spot Prices indicate, subject to the terms listed, the most competitive offers available for the respective product or service of which The Ux Consulting Company, LLC (UxC) is aware, taking into consideration information on bid prices for these products and services and the timing of bids and offers as well. The Ux U₃O₈ Price® (Spot) includes conditions for delivery timeframe (≤ 3 months), quantity (≥ 100,000 pounds), and origin considerations, and is published weekly. *The Ux U₃O₈ Monthly Average Price (Spot MAP) represents the average of all weekly Ux U₃O₈ Prices for the month. The Ux 3-Year and 5-Year U₃O₈ Forward Prices reflect UxC's estimate of prices for U₃O₈ delivery 36 and 60 months forward taking into account market activity and other indicators, using the same quantity and origin specifications as the Spot indicator. The Ux LT U₃O₈ Price (Long-Term) includes conditions for escalation (from current quarter), delivery timeframe (≥ 36 months), and quantity flexibility (up to ±10%) considerations. The Ux Conversion Prices consider offers for delivery up to twelve months forward (Spot) and base-escalated long-term offers (Term) for multi-annual deliveries with delivery in North America (NA) or Europe (EU). The Ux NA UF₆ Price includes conditions for delivery timeframe (6 months), quantity (50-150,000 kgU), and delivery considerations. *The Ux NA and EU UF₆ Values represent the sum of the component conversion and U₃O₈ (multiplied by 2.61285) spot prices as discussed above and, therefore, do not necessarily represent the most competitive UF₆ spot offers available. The Ux SWU Price (Spot) considers spot offers for deliveries up to twelve months forward for other than Russian-origin SWU. The Ux LT SWU Price (Long-Term) reflects base-escalated long-term offers for multi-annual deliveries. **The Ux Spot and Term EUP Values represent calculated prices per kgU of enriched uranium product based on a product assay of 4.50% and a tails assay of 0.30%, using spot and term Ux NA and appropriate spot and term price indicators and are provided for comparison purposes only. All prices, except for the weekly spot Ux U₃O₈ and Forward Prices, are published the last Monday of each month. The Ux Prices represent neither an offer to sell nor a bid to buy the products or services listed. *The Euro price equivalents are based on exchange rate estimates at the time of publication and are for comparison purposes only. (Units: U₃O₈ = US\$ per pound, Conversion/UF₆: US\$ per kgU, SWU: US\$ per SWU, EUP: US\$ per kgU)

The Platts Forward Uranium Indicator price range belongs to S&P Global Platts and is published with permission. Definition of this price is available from Platts.

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The Ux Consulting Company, LLC
 1501 Macy Drive
 Roswell, GA 30076, USA
 Phone: +1 (770) 642-7745
 Fax: +1 (770) 643-2954
 Internet: <http://www.uxc.com/>
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CME/NYMEX UX Futures Activity
Total Contracts by Transaction Month, by Transaction Year

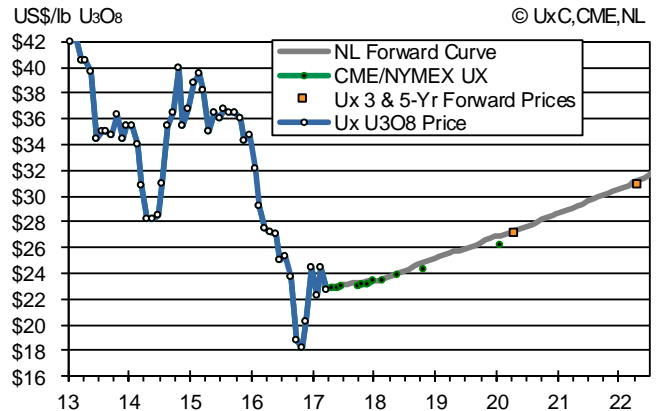


CME Uranium U₃O₈ (UX) Futures

Activity as of April 21, 2017

Settlement	Price	Volume	Open
Oct 2015	\$36.50	1,300	N/A
Nov 2015	\$36.00	700	N/A
Dec 2015	\$34.25	1,176	N/A
Mar 2016	\$29.15	758	N/A
Apr 2016	\$27.50	600	N/A
May 2016	\$27.25	600	N/A
Jun 2016	\$27.00	1,963	N/A
Jul 2016	\$25.00	700	N/A
Sep 2016	\$23.75	300	N/A
Oct 2016	\$18.75	800	N/A
Nov 2016	\$18.25	300	N/A
Dec 2016	\$20.25	1,300	N/A
Jan 2017	\$24.50	133	N/A
Feb 2017	\$22.25	133	N/A
Mar 2017	\$24.50	733	N/A
Apr 2017	\$22.90	333	200
May 2017	\$22.90	133	133
Jun 2017	\$22.90	801	630
Jul 2017	\$22.95	100	100
Oct 2017	\$23.00	400	400
Nov 2017	\$23.10	700	500
Dec 2017	\$23.15	969	413
Jan 2018	\$23.35	1,300	1,000
Mar 2018	\$23.45	100	100
Jun 2018	\$23.90	200	200
Nov 2018	\$24.25	640	640
Feb 2020	\$26.10	200	200
From May 2007		Totals: 101,533	4,516

Ux U₃O₈ Price vs. CME/NYMEX Forward UX Price Curve



UxC Broker Average Price (BAP) Definition

The **UxC BAP** (Broker Average Price), subject to the terms listed, is a calculated average mid-point of bid and offer prices as supplied to UxC by participating brokers. The participating brokers are Evolution Markets and Numerco Limited (the "Brokers"). Data posted by the Brokers are kept confidential and will not be published or made available independently. The Broker data are subject to verification by The Ux Consulting Company, LLC (UxC), which compiles and reports the UxC BAP. In order to have a sufficient number of data points and to represent submissions by all of the Brokers, the UxC BAP includes the best bids and offers reported up to a three-month forward period. This period is consistent with the three-month delivery period for offers considered in the determination of the **Ux U₃O₈ Price**. On a daily basis, the Brokers submit their best bids and offers over a forward three-month period through a secure system. From these postings, UxC separately calculates the UxC Broker Average (BA) Bid and the UxC Broker Average (BA) Offer prices. The UxC BAP is a simple mid-point average of the **UxC BA Bid** and **UxC BA Offer** prices. Other Broker data collected include lot volume on a per offer basis. The UxC BAP is published on a daily basis and is made available to subscribers through email updates and UxC's Subscriber Services website.

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