

## 2011 Winter Survey Results: Fukushima: Before & After

Over the period of approximately two months, UxC conducted the winter semi-annual survey of the nuclear fuel market. Before we could release the results of the survey, the Fukushima Daiichi accident occurred. This made the coverage of the accident more pressing, and made the results of the survey less relevant, since the accident itself was likely to alter expectations that market participants had about the future.

We elected to address this situation by conducting the same market survey again with a quick turnaround (responses were due by April 1). This was done to provide a more relevant picture of current market expectations, but it also provides us with a unique insight of how the participants viewed the market just before and after the accident. We want to express our sincere gratitude to all that participated in the surveys, especially those that "re-participated" in the second survey.

Given the large quantity of data collected, it is impossible to cover each survey question thoroughly in this sum-

mary; however, we have decided to initially present the highlights and most important findings here.

**General Market Impacts** – Doing the survey allows us to test two hypotheses. One is that the uranium market would be seen to be affected more by Fukushima than the enrichment market. A second is that China's nuclear growth prospects would be seen to be little affected by the accident. Both hypotheses hold up based on the survey results collected.

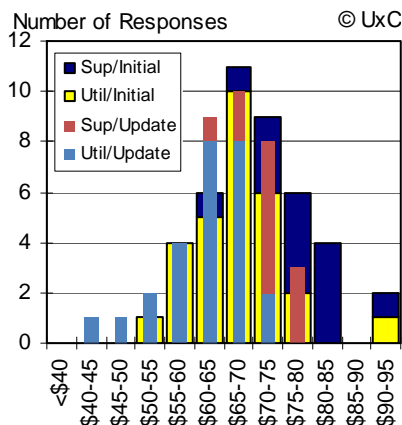
However, it should be noted that during the course of the second survey, market participants were able to observe uranium prices changing but not so much SWU prices changing, which would tend to influence their view that uranium prices would change more. Changes in SWU prices were observable by the end of the month – and they didn't change much – but by this time most of the responses had been received.

**Uranium Prices** – There was a notable change in opinion with respect to the expectations for spot uranium prices after Fukushima. As for spot price ex-

**Ux U<sub>3</sub>O<sub>8</sub> Price: (4/4/11)**  
**\$59.00 (-\$3.50)**

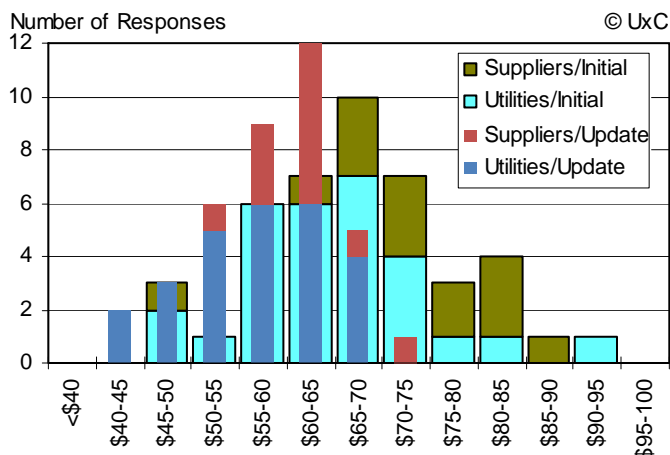
**Ux LT U<sub>3</sub>O<sub>8</sub> Price: (3/28/11)**  
**\$72.00**

### Where will the Long-Term U<sub>3</sub>O<sub>8</sub> price be at year-end?

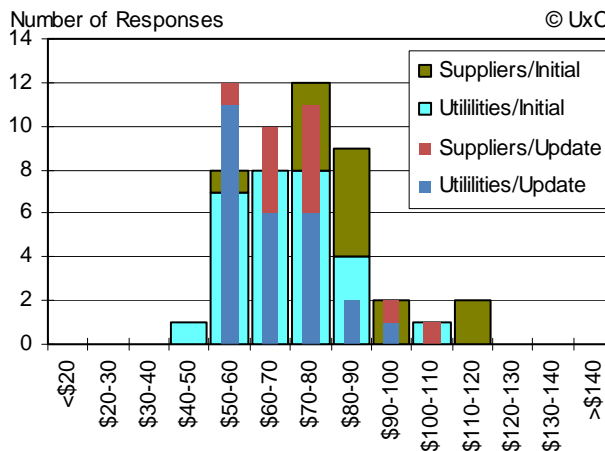


pectations for the end of 2011 (see lower left chart), there was a clear shift from the \$65-\$70 range down to the majority choosing the \$60-\$65 range. There was also a notable change for spot prices five years out. Before the accident, the most widely selected range was \$70-\$80, and some respondents seeing price going as high as \$110-\$120. After the accident, the most widely selected range was \$50-\$60, and only one respondent expects price to go above \$100 (see lower right chart). Finally, in response to

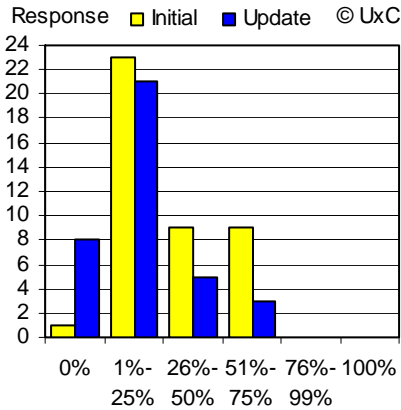
### Where will the spot U<sub>3</sub>O<sub>8</sub> price be at year-end?



### Where will the spot price be in 5 years (2016\$)?



**What is the probability that the spot price will break \$100 within the next two years?**

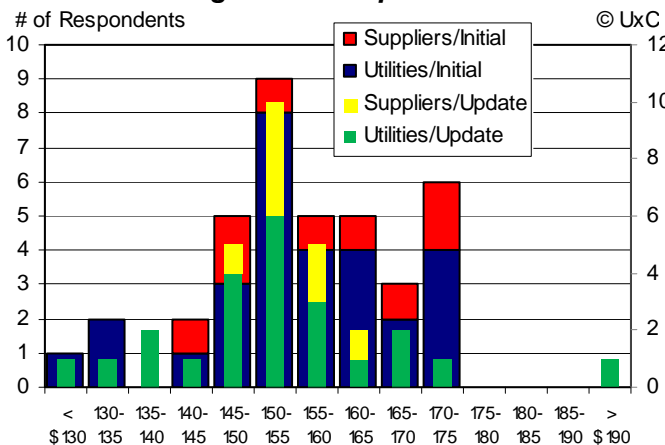


the question concerning the probability of the spot price breaking \$100 within the next two years, while most respondents saw only a 1-25% chance both before and after the accident, there was a clear drop in those viewing the probability higher than 25% after the accident (see chart above).

In terms of long-term uranium prices by year-end, prior to Fukushima, we saw an average price expectation of \$73, but this shifted down to a \$66 average afterwards. Still, most selections in both surveys were for LT uranium prices to track somewhere in the \$60-\$75 range.

**Conversion Prices** – Without going into all the details due to space limitations, the key conclusions from our conversion price expectations questions were that market participants saw on average a \$1 per kgU drop in both North American (NA) and European (EU) conversion prices after the accident. For example, 2011 year-end NA spot con-

**Where will long-term SWU prices be in 5 Years?**



version was expected by most to be in the \$12-\$14 range prior to Fukushima, but dropped to the \$11-\$13 range afterwards. In terms of LT conversion prices, expectations for EU year-end was clearly in the \$15-\$16 range before Fukushima, but we saw sizeable numbers selecting the \$13-\$15 range afterwards. Overall, some of this drop in conversion price expectations may also be attributable to the DOE UF<sub>6</sub> barter plans, which were announced in March and could have impacted market sentiment.

Notably, in a separate question we asked about China's need to import more conversion or UF<sub>6</sub> to supplement domestic supplies, there was a similar belief before and after Fukushima that China would rely most heavily on domestic supply. Thus, the influence of China on the conversion market is viewed by most as tangential given the belief that China will take care of itself.

**SWU Prices** – When it comes to expectations of long-term SWU prices five years out, the picture does not change as much as it does for uranium prices. The mode of the responses is still in the \$150-155 SWU range, but since the accident there are fewer responses in the higher-price increments, as shown in the chart below. Overall, the average expected price five years out declined from \$158 before the accident to \$138 following the accident.

**Uranium Supply** – We asked about whether the uranium price has increased enough to support bringing higher-cost

planned uranium projects online to meet demand through 2020. Interestingly, the split between Yes and No responses did not shift much after Fukushima, with Yes leading nearly 3 to 1 in answers.

In terms of commentary, we found

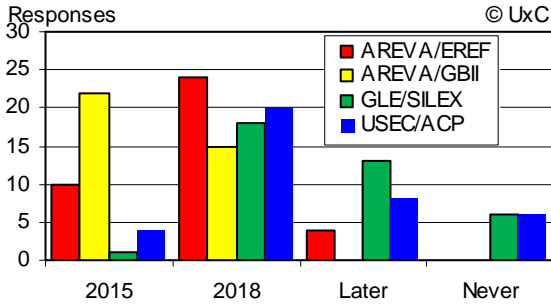
that respondents believe the key to investment incentives in new mines is not only higher prices but also sustaining these prices in a more "stable" market. For those who think prices need to be higher for new mines, there was a range of opinion between \$75 and \$100 as the preferred price level. The main comment we got after Fukushima was that since future demand would drop, there is less of a requirement for much higher prices than currently available to incentivize necessary new primary supply, although almost everyone agrees that some level of new uranium production is critical.

**Enrichment Supply** – We asked a few questions about future SWU production, both in China and with various new western enrichment plant projects. As for the question on whether Chinese SWU capacity using domestic centrifuges will reach a total of 5.0-7.5 million SWU/yr by 2020, the predominant response was "Yes". While there is a variety of opinion about the ability of China to completely supply its growing enrichment needs through domestic plants, nearly every respondent views China's domestic centrifuge program as a foregone conclusion. This belief did not shift after Fukushima at all.

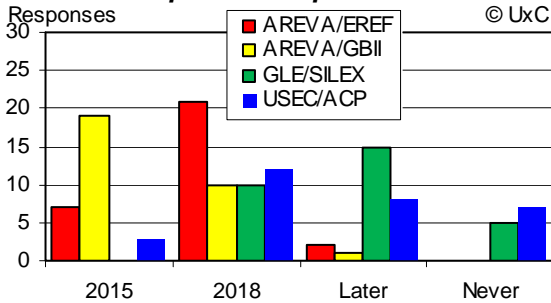
However, where we did see a significant change in opinions was the likelihood of western enrichment plants being completed on schedule. As the upper charts on the next page indicate, after Fukushima, expectations for both USEC's ACP and GLE's SILEX plant were downgraded, with sizeable numbers showing a belief that these plants will never be built. However, the schedule for completion of AREVA's GB II plant remains high for 2015 and confidence in the EREF being completed by 2018 is also strong. Perhaps the key takeaway here is that the Fukushima accident is likely to make it harder to get new enrichment technologies financed, especially in a market where the main nuclear growth country – China – may have little need for external supplies.

# News Briefs

## When do you think the following U.S. enrichment plants will reach initial operating capacity (IOC)? Initial Responses



## Updated Responses

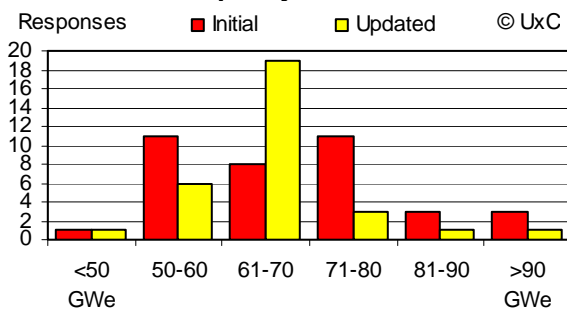


### China Nuclear Power in 2020 –

Views on the amount of installed nuclear power capacity in China changed somewhat after the accident. Before the accident, the 50-60 GWe, 60-70 GWe, and 70-80 GWe ranges were all well represented. After the accident, results were more centered in the 60-70 GWe range, as shown in the chart below. The average expected installed capacity for China fell from roughly 74 GWe before the accident to 70 GWe after the accident.

Commentary on this question in the post-Fukushima survey reflected many peoples' beliefs that China will also face delays in new reactor construction due to additional safety requirements and complicate any actions to convince the public that their reactors are safe. How-

## What do you think China's operating nuclear capacity will be in 2020?



ever, it deserves noting that, overall, few believe that China will make a wholesale shift away from nuclear power due to Fukushima. (It should be noted that last week it was reported that China revised its new five-year plan 2020 target for nuclear power down from 90 GWe to 80 GWe – see story at right.) Thus, the expected impressive growth in China's reactor program over the coming decade will now be even more critical to the market in many ways given that nuclear power growth in other places is likely to be much less aggressive. This was reflected in the final question

we asked about potential newcomer nuclear countries, of which only the UAE was seen as likely to have reactors built by 2020. Other countries like Vietnam, Turkey, and Italy all saw their reactor futures dim in the eyes of our survey respondents following Fukushima.

**Conclusions** – This was a unique market survey for us, but with the tremendous participation of so many market participants, we were able to obtain an excellent early snapshot of how the Fukushima accident has altered the perceptions of the nuclear fuel and reactor markets. Overall, we saw drops in price expectations across the board, but the most pronounced shifts were in uranium. Still, the largest impacts on supply appeared to be in enrichment,

where marginal new plants may have a lot harder time given the uncertainty of future demand growth. Ultimately, the critical importance of China was reaffirmed after Fukushima, with only a slight downgrading of China's future reactor expansion anticipated.

## China's new nuclear target still to be decided

Recently, several news sources reported on the impact of the Fukushima accident on China's nuclear energy plans. On March 28, *Reuters* reported that the China Electricity Council (CEC) suggested that the country should lower its nuclear energy targets for 2020 as well as slow down the construction of inland reactors. According to *Reuters*, in 2010 the CEC had proposed that China reach 90 GWe of nuclear capacity by 2020. Now, the CEC is suggesting this target should be lowered to 80 GWe. Furthermore, on April 1, *Bloomberg* quoted an official from China's National Development and Reform Commission stating that the nuclear energy target for 2020 would be reduced and that the use of solar energy would be increased. China's official nuclear energy target for 2020 is expected to be between 70 and 80 GWe.

As reported earlier, in light of events in Japan, China has decided that it will temporarily suspend approvals for new reactors and will evaluate the safety of existing units. Preconstruction activity will also be suspended for those reactor projects that have already been approved but have not yet progressed to full construction, and new safety standards will be implemented.

## Update on crisis at Fukushima Daiichi

At the end of last week's update of the Fukushima disaster, we expressed our hope that the coming week would bring better news of positive developments at the stricken plant site. This has not been the case, as the plant situation is still not under control, and new problems have arisen, or at least just been discovered.

While still lacking sufficient credible information on the full scenario playing out at the site, the focus of efforts re-

ported in the media has shifted significantly away from the direct risks associated with the overheating of the reactor cores to the consequences of the actions taken earlier in response to the emergency, which were intended to cool the cores. Without any new information on the status of the cooling efforts, TEPCO is now focused on a crack in "a concrete shaft" at Unit 2, through which highly contaminated water is leaking into the Pacific Ocean. Efforts to stop the flow by clogging the crack with concrete, and later using a chemical compound mixed with sawdust and newspaper, have failed as of this writing.

Beginning today, Japan is dumping about 11,500 tons of contaminated water into the Pacific, the vast majority of which is coming from the plant's central waste treatment facility. The plan is to then use this facility to collect the most highly contaminated water coming from Unit 2 in the facility. Japanese Chief Cabinet Secretary Yukio Edano, who has been a central figure in managing the crisis for the Japanese government since it started last month, called the dumping "unavoidable."

It has also been reported that highly contaminated water has been discovered in Units 5 and 6, which are thought to be in safe shutdown mode with containment intact. TEPCO officials think the contaminated water is coming from a drain that overflowed with contaminated water from Units 1-4, rather than from Units 5 or 6, but they are not certain.

The primary containment structure of Unit 2 is known to have been breached fairly early in the crisis, after a tremendous explosion occurred at neighboring Unit 3. Significant damage now exists at Units 1-4, each of which has experienced fuel overheating and possibly melting to some degree. Given the lack of attention to the continued cooling of the overheated fuel located at the units, one might assume that this portion of the disaster has passed, but no reports have directly stated this. Instead, it has been reported that the electric power supply to

the equipment being used to cool the fuel in these units has successfully been switched from diesel generators to an offsite power supply. This is good news, but it does not mean that adequate cooling necessarily exists.

More than three weeks after the earthquake and tsunami struck in the Pacific Ocean near the Fukushima Dai-ichi plant, the nuclear crisis is still not under control. New problems seem to arise, or be discovered, almost every day. While this is bringing additional hardships to hundreds of thousands of people already displaced from their homes by the earthquake and tsunami, we hope that TEPCO and the world nuclear power community will succeed in containing the nuclear component of the disaster so that Japan and the world can focus on the tremendous human tragedy attributable to the overwhelming natural forces that were unleashed on March 11, 2011.

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### ***Entergy unable to sell Vermont Yankee***

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In a March 30 press release, Entergy announced that it has not been able to find a buyer for its Vermont Yankee nuclear power plant. "Although we received interest from a number of companies, the conclusion of the sale process, without a sale, was driven primarily by the uncertain political environment in Vermont," said Entergy Wholesale Commodities President Richard Smith. "The plant's strong operating performance was attractive to potential buyers; the political uncertainty was not." Entergy also stressed that its decision to end the sales process was not related to the nuclear crisis in Japan, and said it could take another look at selling the plant if conditions were to change.

In its press release, Entergy also stated that it completed negotiations with Vermont Electric Cooperative, for a 20-year agreement to sell electricity from Vermont Yankee. The agreement must still be approved by Vermont Electric Cooperative's board of directors and is

## **Industry Calendar**

- April 5-8, 2011  
**World Nuclear Fuel Cycle**  
NEI/WNA  
<http://www.nei.org/newsandevents/>  
Swissotel Chicago  
Chicago, IL, USA
- April 19-20, 2011  
**Small Modular Reactor Conf.**  
Nuclear Energy Insider  
<http://www.nuclearenergyinsider.com/smr/>  
Marriott Hotel  
Columbia, SC, USA
- May 9-11, 2011  
**Nuclear Energy Assembly**  
NEI  
<http://www.nei.org/newsandevents/>  
Grand Hyatt Washington  
Washington, DC, USA
- May 12-13, 2011  
**China Nuclear Energy Congress**  
China Decision Makers  
<http://www.chinadecisionmakers.com/>  
Crowne Plaza Hotel  
Beijing, China
- May 13, 2011  
**Blue Ribbon Commission**  
<http://www.brc.gov/events.html>  
Renaissance DuPont Circle  
Washington, DC, USA
- May 23-24, 2011  
**Platts Small Modular Reactors**  
Platts Nuclear Energy  
<http://www.platts.com/Conference>  
Mandarin Oriental Washington  
Washington, DC, USA
- June 5-7, 2011  
**38<sup>th</sup> Annual WNFN**  
World Nuclear Fuel Market  
<http://www.wnfm.com/annualmeeting/>  
Barcelo Renacimiento Hotel,  
Seville, Spain
- June 6-8, 2011  
**AtomEXPO 2011**  
Rosatom  
<http://2011.atomexpo.ru/en>  
Manezh Central Exhibition Hall  
Moscow, Russia

Details are available at:  
[http://www.uxc.com/c/data-industry/uxc\\_calendar.aspx](http://www.uxc.com/c/data-industry/uxc_calendar.aspx)

also subject to Entergy obtaining the necessary approvals from the state of Vermont to operate Vermont Yankee for an additional 20 years beyond March 2012. Although Vermont Yankee has already received a 20-year license extension from the NRC, the Vermont

legislature must still vote to authorize the plant's continued operation. Vermont is the only U.S. state whose legislature has the authority to determine whether a plant can continue operating past its original license. There is considerable uncertainty as to whether Vermont Yankee will be able to continue operation. In January 2010, Vermont's Senate voted overwhelmingly against allowing continued operation of the plant, but the legislature could consider the issue again later this year.

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### ***License renewal process for Salem and Hope Creek nuclear plants moves forward***

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In an April 1 press release, the U.S. Nuclear Regulatory Commission (NRC) announced that it completed a final supplemental environmental impact statement and final safety evaluation reports for the license renewal applications for both the Salem and Hope Creek nuclear power plants in New Jersey. NRC staff has not found any issues that would prevent the plants from obtaining 20-year license renewals. Before the NRC decides whether to grant final approval for license renewals, the Advisory Committee on Reactor Safeguards will review the safety evaluation reports and license applications. The committee will discuss license renewal for the plants during a meeting scheduled for May 12.

The Salem nuclear power plant has two pressurized water reactors and Hope Creek has a single boiling water reactor. If final approval for license renewal is granted, Unit 1 at Salem would be able to operate until August 2036, Unit 2 at Salem would be able to operate until April 2040, and Hope Creek would be able to operate until April 2046.

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### ***RWE AG files suit over Merkel's three-month moratorium***

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On April 1, German utility RWE AG filed suit against the local German government over Chancellor Angela Merkel's order that its Biblis A reactor be shut

down for three months. Merkel made the announcement on March 14 that the government was temporarily suspending the 2010 law that allowed for life extensions. Government officials cited Germany's Atomic Energy Law as its legal basis.

"Since German nuclear power plants comply with all relevant safety requirements, there are no legal grounds for decommissioning them," said RWE AG. "In taking the legal step of appealing against the decommissioning, RWE is seeking to protect the interests of its shareholders."

RWE AG is the first German plant owner to take legal action. If successful, German states could be financially responsible for the money that is lost during the forced shutdown. RWE AG is expected to lose US\$1.4 million a day while Biblis A remains unused.

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### ***Bomb explodes at Swissnuclear offices***

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On March 31, two people sustained minor injuries at the offices of Swissnuclear in the Swiss town of Olten after a parcel bomb delivered there exploded. The offices have reportedly remained open in the wake of the incident and local and federal authorities have launched immediate investigations.

Swissnuclear is the nuclear energy sector of Swisselectric, the organization of Swiss electricity grid operators. Swissnuclear employs representatives of the companies Alpiq, Axpo, BKW, CKW, and EGL. Nuclear utility, Axpo has condemned the attack and stated, "It is unfortunate and scary that people are turned into targets. Violence in a democratic society can never be a means of settling differences."

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### ***Gallup poll finds most Americans still believe nuclear energy is safe***

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A Gallup poll carried out from March 25-27 that surveyed 1,027 U.S. residents found that 58% of respondents believe that nuclear power plants in the United

States are generally safe. Another 36% viewed nuclear power as generally unsafe, and six percent had no opinion. A previous Gallup poll from 2009 found that 56% of respondents perceived nuclear power plants to be safe, virtually identical to the current poll. The current Gallup poll also asked whether greater use of nuclear energy is needed to help solve the nation's energy problems. Forty-six percent of respondents said greater use of nuclear power is necessary but a slightly larger number, 48% believe the risk of nuclear power is too great to justify increased use. The poll has a margin of error of plus or minus four percent. Gallup's write-up of the poll results is available at:

<http://www.gallup.com/poll/146939/Majority-Americans-Say-Nuclear-Power-Plants-Safe.aspx>.

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### ***India's nuclear regulator to become independent***

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India's government has decided to make its nuclear regulator, the Atomic Energy Regulatory Board (AERB), truly separate from its Department of Atomic Energy. Under the current structure, both the nation's Atomic Energy Agency and the Atomic Energy Regulatory Board are under the authority of India's Atomic Energy Commission. This has led to concern regarding the AERB's independence because under Indian law the head of India's Department of Atomic Energy Agency also serves as ex-officio Chairman of the Atomic Energy Commission. "We will strengthen the Atomic Energy Regulatory Board and make it a truly autonomous and independent regulatory authority. We will ensure that it is of the highest and the best international standards," said India's Prime Minister, Manmohan Singh, as quoted by *Xinhua News*. Singh also vowed to bring greater openness and transparency to India's nuclear energy program.

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### ***Russia & Kazakhstan sign nuclear cooperation agreement***

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On March 30, Russia and Kazakhstan signed a comprehensive program of

cooperation in the area of nuclear power. The agreement was signed by the Director General of Rosatom Sergei Kiriyyenko and the Deputy Minister of Industry and New Technologies of Kazakhstan, Duisenbai Turganov. The program details cooperation between the two countries in the front end of the nuclear fuel cycle, including uranium and enrichment. Another potential project is construction of a nuclear power plant in Kazakhstan, which has been under discussion for some time.

According to Kiriyyenko, Kazatomprom is expected to acquire an unspecified share in the Urals Electrochemical Combine (UECC) by the end of the year. The share to be acquired by Kazatomprom will be decided during the development of the project's financial and economic model. Rosatom and Kazatomprom already cooperate within the scope of the International Uranium Enrichment Center (IUEC), which is focused on security of supply and nonproliferation aspects as opposed to a new commercial enrichment initiative.

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### ***Nazarbayev wins presidential elections in Kazakhstan***

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According to preliminary results released by the Central Election Commission of Kazakhstan, the incumbent President Nursultan Nazarbayev won the presidential elections with 95.5% of the vote. The other three contenders split the remaining 4.5% of the vote. The final results will be announced by April 9. The elections were announced on January 31 and are being held almost two years early, having been originally scheduled for 2012. The elections were called after President Nazarbayev had unexpectedly rejected a proposal to hold a national referendum on extending his term in office until 2020. The Constitutional Council found on January 31 that a referendum would be unconstitutional.

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### ***Proposed EPA regulations could cost U.S. plants***

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A proposed rule issued by the Environ-

mental Protection Agency (EPA), designed to prevent fish from being sucked into cool-water systems, could affect nuclear power plants that pull water from rivers and lakes. The EPA estimates the cost would be \$384 million for utilities, but opponents such as Rep. Fred Upton (R-MI) say it could run as high as \$1 billion for nuclear generators. The EPA must take final action by July 27, 2012.

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### ***BHP Billiton advances Olympic Dam Expansion to Feasibility stage***

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On March 30, BHP Billiton announced that the Olympic Dam Project (ODP) Expansion has progressed into the Feasibility Study phase. The decision comes before the pending release of ODP's Supplementary Environmental Impact Statement (SEIS) and the start of the formal assessment of the project by the Commonwealth, South Australian and Northern Territory governments.

Dean Dalla Valle, BHP's Uranium President, said the project's progression into Feasibility followed the release of its Draft Environmental Statement in May 2009 and the subsequent assessment of more than 4,000 public submissions received on a range of issues. "The EIS team spent more than a year preparing answers to all the issues raised in the submissions and submitted this information along with additional studies in its SEIS which was handed to the Commonwealth for an adequacy test in December 2010," said Dalla Valle. "We are now awaiting permission from the Commonwealth to publish the SEIS, which will allow formal assessment of the project by the respective governments."

The Olympic Dam Project Expansion aims to develop a new open pit copper mine and associated gold and uranium byproducts alongside its existing underground operation. Copper production would increase from around 180,000 tonnes per annum to 750,000 tonnes per annum over the next 30 years, while uranium production would increase from about 10 million pounds U<sub>3</sub>O<sub>8</sub> to over 40

million pounds U<sub>3</sub>O<sub>8</sub>.

Dalla Valle stated that as part of the project, BHP Billiton will invest around A\$20 million over the next 10 years to support indigenous communities and more than A\$20 million in community investment as well as major land management and water conservation programs across 21,000 square kilometers of arid lands. A final decision on the ODP Expansion by Commonwealth, State and Territory governments is expected in the second half of this year.

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### ***Water supply to Namibia's U mines reduced by 25% amid shortage***

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NamWater announced March 25 that the water supply to Namibia's uranium mines will be reduced by 25% due to a shortage in the central coastal area. The shortage will affect Namibian mines to a varying degree. Rössing hopes to maintain normal uranium production by replacing freshwater in the mill wherever possible and by avoiding any non-essential consumption. Paladin's Langer Heinrich mine is not affected, as it has collected more than 500,000 cubic meters of rainwater in two open pits during the past two weeks. AREVA's planned Trekkopje mine is also not affected, as it is fed with water supplied by its own desalination plant.

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### ***Cameco & Mitsubishi advance Kintyre plans in Western Australia***

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*The Australian* and *Perth Now* reported that Cameco Corporation and Mitsubishi have released an environmental scoping document for the Kintyre uranium mine in Western Australia, calling for submissions on plans to gain environmental approval for the proposed uranium mine. With public attention likely to focus on transport arrangements for the estimated 2,500 to 3,600 t U<sub>3</sub>O<sub>8</sub> to ship from the mine each year, Cameco is proposing to commission a substantial transport safety survey as part of its environmental documentation.

Cameco plans to haul ore from its mine, just south of Telfer, Western Australia, through Telfer, then through Port Hedland, Newman, Meekatharra, Mount Magnet, Leinster, Lenora, Menzies, and then onto the proposed Parkeston transport hub outside of Kalgoorlie. From there, uranium concentrate would be loaded onto rail cars for transport to port in either Adelaide or Darwin. If the Parkeston hub is not built by 2013, the concentrate would be trucked through Kalgoorlie to the Eyre Highway.

Cameco expects to send between 55 and 70 truck convoys per year along the estimated 2,000-kilometer route. The transport risk study will be conducted by the Australian Nuclear Science and Technology Organisation. The public comment period on the Cameco environmental scoping document closes on April 11.

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### ***Wits Gold to consider economics of uranium mining***

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Wits Gold announced March 30 that it has appointed Turgis Consulting (Pty) Limited to complete a preliminary economic assessment or scoping study at Wits Gold's combined De Bron-Marriespruit South (DBM) project in southern Free State goldfield, South Africa. Turgis will focus on producing preliminary mine design options to optimally exploit the DBM orebody. Emphasis will be placed on accessing the shallow high grade core at DBM in order to provide higher financial returns during the early stages of mining.

Turgis will also consider the economics of mining the Indicated Resource of uranium that occurs within the Leader Reef, containing 17.0 Mt at 0.16 kg/t U<sub>3</sub>O<sub>8</sub> (~6.1 million pounds U<sub>3</sub>O<sub>8</sub>). A National Instrument 43-101 compliant technical report on the DBM resource estimate is being finalized and will be filed on SEDAR in April 2011.

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### ***Niger receives loan for Azelik mine from China***

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On April 1, *Reuters* reported that Niger

has secured a 650 million yuan (US\$99 million) preferential loan from China's Export-Import Bank to fund development of the Azelik uranium mine in northern Niger. The loan is pursuant to Niger and China National Nuclear Corp.'s (CNNC) SOMINA joint venture, which was formed in 2007 for development of the Azelik deposit. According to a government statement read over Chinese state television on March 31, "The cabinet met on Thursday and approved the loan agreement between the Export-Import Bank of China worth 650 million yuan. This agreement is for development of uranium from Azelik in Niger." *Reuters* cited an unnamed source close to the deal that stated the loan between China and Niger is repayable in 15 years with a five-year grace period and an interest rate of 2%. Neither China nor Niger has publicly commented on the terms of the loan, however.

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### ***State of Utah rejects request for water for Mancos Resources' uranium mill***

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On March 29, Utah's State Engineer, Division of Water Rights (DWR), rejected the request by Mancos Resources Inc. for water for a proposed uranium mill west of Green River, Utah. Mancos Resources had requested a new appropriation of 800 acre feet of water from the Green River. The State Engineer determined: "The applicant has not provided sufficient information to support a finding that the applicant has the financial ability to pursue this application in a timely manner."

Mancos Resources may request reconsideration or request judicial review of the decision, but this is not likely. Mancos failed to respond to a February 16, 2011, DWR request for financial information. The company does not have any uranium mines in the Green River area.

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### ***Fission announces drill results at Waterbury's J-Zone***

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On March 29, Fission Energy Corp. and

its exploration partner, the Korea Waterbury Uranium Limited Partnership, announced assay results for fourteen step-out drill holes at the J-Zone of the Waterbury Lake uranium property, located in the Athabasca Basin. Highlights from this drilling include: 2.5 meters grading 0.12% U<sub>3</sub>O<sub>8</sub>, 1.5 meters grading 3.24% U<sub>3</sub>O<sub>8</sub>, 3.5 meters grading 10.91% U<sub>3</sub>O<sub>8</sub>, 2.0 meters grading 46.15% U<sub>3</sub>O<sub>8</sub>, and 14.5 meters grading 7.84% U<sub>3</sub>O<sub>8</sub>. Drilling at the J-Zone has been associated with a broad zone of alteration that has allowed the company to extend the mineralized boundary of the J-Zone to the west and north, which remains open in all directions, particularly to the west. Fission is still awaiting assay results for several drill holes sunk at J-Zone throughout the Winter 2011 drilling season. Fission plans for the Winter 2011 drilling program to be completed in early April.

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### ***Athabasca Uranium to acquire Hodges Lake property***

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Athabasca Uranium Inc. entered into an agreement on March 31 with an arm's-length vendor where Athabasca Uranium may earn a 100% interest in the Hodges Lake uranium property, located in the Athabasca Basin. The property covers 4,722 hectares on the Basin's eastern margin and is contiguous with the company's McGregor Lake project. Athabasca Uranium can earn a 100% interest in the project by paying C\$25,000 and issuing 600,000 common shares to the Vendor on Closing, and by filing C\$3.5 million in qualified exploration assessment credits on either the property itself or on Athabasca's other properties under option within its McGregor Lake project area within four years. The Hodges Lake property is the second of three strategic acquisitions in the Athabasca Basin on which the company has an exclusive right of first offer.

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### ***Cue completes pump test at Yuty***

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Cue Resources Ltd. announced March 30 that it completed an aquifer pump test

at the San Antonio deposit of its 100%-owned Yuty uranium project in south-eastern Paraguay, South America. Hydro-Engineering of Casper, Wyoming, carried out the test of five wells to dimensionalize aquifer properties as well as expected recovery and injection rates. Robert Tyson, President and CEO of Cue stated, "The pump test is a critical component to determining and understanding the hydro-geological characteristics of the project for the In-Situ Recovery Mining process." Final results of the test program will be published once received and reviewed by Cue.

**Pitchstone receives assays from Marble Ridge**

Pitchstone Exploration Ltd. announced assay results have been completed for drill cores from a Reverse Circulation (RC) drilling program at the Marble Ridge zone of the Dome property, located in Namibia. During the February 2011 drill program, 28 drill holes were completed to follow-up on results from drilling in 2010 that intersected a horizontal, near-surface layer of uranium and vanadium mineralized in calcrete. Highlights from these assay results include: 2.0 meters grading 0.0298% U<sub>3</sub>O<sub>8</sub>, 1.0 meter grading 0.365% U<sub>3</sub>O<sub>8</sub>, 1.0 meter grading 0.0199% U<sub>3</sub>O<sub>8</sub>, and 3 meters grading 0.0219% U<sub>3</sub>O<sub>8</sub>. The company used these latest results to surmise that the mineralization at Marble Ridge occurs within a calcrete paleo-

channel that is now estimated to be at least 1,900 meters long and 200 meters wide, which is open along strike. The company plans to test extensions along this strike length later this year.

**Thundelarra agrees to JV with Resource Star at Spinifex**

Thundelarra Exploration Ltd. announced April 4 that it agreed to an exploration Joint Venture (JV) with Resource Star Ltd. on its Spinifex uranium project in Western Australia. Resource Star will earn a 20% equity interest in the project by completing 1,000 meters of drilling during the first 12 months of the JV, and a further 31% by completing a total exploration expenditure of A\$500,000. Following this initial project contribution period, Thundelarra may then opt to contribute to project expenditure on an equity basis or dilute further to a 30% share on the completion of a JORC mineral resource estimate, and again may elect to contribute or dilute to a 10% share on the completion of a Feasibility Study.

The Spinifex project covers roughly 30 square kilometers in Western Australia, which has shown from sampling programs to host a 10 kilometer unconformity.

**B&W Conversion Services LLC to take DOE DUF<sub>6</sub>**

B&W Conversion Services, LLC., a single-purpose company formed by Babcock & Wilcox (B&W) Technical Services Group and URS Energy & Construction to operate the U.S. Department of Energy's (DOE) depleted uranium hexafluoride (DUF<sub>6</sub>) facilities at uranium enrichment facilities in Paducah, Kentucky, and Portsmouth, Ohio, announced March 29 that it had assumed responsibility of the DOE's DUF<sub>6</sub> project at both sites. DOE

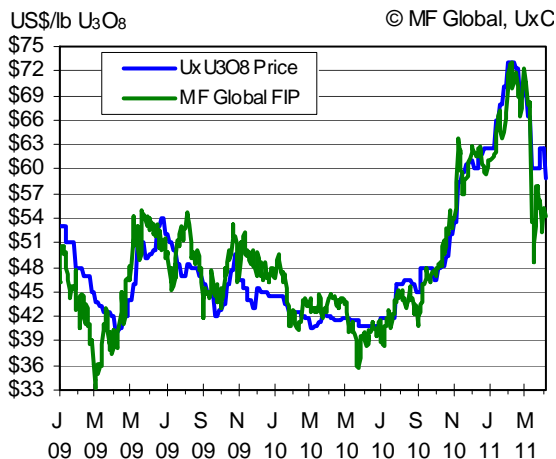
<b>UxC Monthly Spot Market Data</b>				
<b>Volume Average</b>				
	<b>Ux U3O8</b>	<b>(mill lbs U<sub>3</sub>O<sub>8</sub>e)</b>	<b>Leadtime</b>	<b># of</b>
<b>Month</b>	<b>Price</b>		<b>Months</b>	<b>Trans</b>
Jan '10	\$42.50	4.79	1.9	16
Feb	\$41.75	3.27	1.5	17
Mar	\$42.00	5.02	2.3	24
Apr	\$41.75	2.29	1.5	14
May	\$40.75	4.29	2.8	21
Jun	\$41.75	3.05	4.3	16
Jul	\$46.00	4.76	2.2	21
Aug	\$45.00	5.28	1.9	26
Sep	\$46.50	3.26	2.4	22
Oct	\$52.00	6.11	2.0	44
Nov	\$61.00	4.20	2.7	31
Dec	\$62.50	3.24	2.1	15
Jan '11	\$73.00	5.18	1.9	27
Feb	\$69.75	6.68	2.2	35
Mar	\$62.50	7.21	1.7	50

provided B&W Conversion Services LLC with a "Notice to Proceed" on January 3, which had a stipulated 85-day transition period. As of March 29, that period has expired and, pursuant to a five-year, \$428 million contract signed on December 8, 2010, B&W Conversion Services LLC will now begin management of the DUF<sub>6</sub> contained at these facilities.

DUF<sub>6</sub> inventory was generated at Paducah and Portsmouth during operation of the gaseous diffusion enrichment plants located there. B&W Conversion Services constructed facilities at both sites to convert approximately 700,000 metric tons of DUF<sub>6</sub> stored at both sites into a more stable chemical form, which will be suitable for beneficial reuse or disposal. Construction and operation of these plants was mandated by Congress, and groundbreaking on these facilities occurred in 2002. Construction at Portsmouth was completed on May 20, 2008, and at Paducah, on December 19, 2008.

The Portsmouth DUF<sub>6</sub> inventory is expected to be processed in approximately 18 years, and Paducah's larger inventory will be processed within 25 years. The Portsmouth site was authorized to begin Hot Functional Testing in May 2010 and Paducah was authorized to begin Hot Functional Testing in September 2010.

**Ux U<sub>3</sub>O<sub>8</sub> Price vs. MF Global FIP**





# The Market

## March Market Review

Uranium spot activity set a new transaction record last month in the aftermath of the Japanese disaster. A total of 50 spot transactions were reported awarded during the month of March, with 39 transactions as U<sub>3</sub>O<sub>8</sub> and the remaining eleven in the form of UF<sub>6</sub>. There were no conversion or enrichment spot transactions reported. Due to the smaller size of the transactions, total volume was only about 7.2 million pounds U<sub>3</sub>O<sub>8</sub> equivalent, which is the eighth largest single-month volume. The term market was fairly inactive for the month with respect to contract awards. Only two term enrichment awards were reported during March, and current volume levels are being withheld due to confidentiality.

## Uranium Spot Market

The spot market continues to be volatile as it heads into its fourth week following the Fukushima Daiichi disaster. Prices, which rebounded to over \$60 this past Monday, quickly slipped back below \$60 during the course of the week as word began to leak out that China was revising downward its nuclear capacity target

for 2020 released in its most recent five-year plan. Over the past week, China lowered its (increased) 2020 target by 10 GWe (from 90 GWe to 80 GWe) and it lowered its 2015 target as well. While this is still a large increase in China's official plans (the last official target was 40 GWe), it is still a reduction from an even higher forecast that some buyers may have been betting on, and hence the reaction in price. The spot uranium price reacted notably after the new five-year plan (and adjustment) was announced.

There have been fewer sources of supply being offered on the spot market over the past week or so. And a number of recent deals, as well as an increasing number of offers, have been for smaller quantities (50,000 or less pounds), which fall under UxC's 100,000 pound size definition. There were a number of spot deals done over the past week, prior to month-end, totaling well over one million pounds U<sub>3</sub>O<sub>8</sub>e and included in last month's total.

Offers fell last week, and some buying interest returned as deals were done below the \$60 mark. However, the market is relatively quiet to start this week as it is a travel day for many heading to the

Ux Price Indicators (€Equiv**)			
<b>Weekly (4/4/11)</b>		1 US\$ = .70340€	
<b>Ux U<sub>3</sub>O<sub>8</sub> Price</b>	<b>\$59.00</b>	<b>€41.50</b>	
<b>Mth-end (3/28/11)</b>		1 US\$ = .70950€	
<b>U<sub>3</sub>O<sub>8</sub></b>	Spot	<b>\$62.50</b>	€44.34
	Long-Term	<b>\$72.00</b>	€51.08
<b>Conversion</b>	NA Spot	<b>\$12.00</b>	€8.51
	NA Term	<b>\$16.00</b>	€11.35
	EU Spot	<b>\$12.00</b>	€8.51
<b>EU Term</b>		<b>\$16.50</b>	€11.71
	NA Price	<b>\$175.00</b>	€124.16
<b>UF<sub>6</sub> Spot</b>	NA Value*	<b>\$175.30</b>	€124.37
	EU Value*	<b>\$175.30</b>	€124.37
<b>SWU</b>	Spot	<b>\$155.00</b>	€109.97
	Long-Term	<b>\$155.00</b>	€109.97
<b>EUP</b>	NA Spot**	<b>\$2,757</b>	€1,956
	NA Term**	<b>\$3,052</b>	€2,165

WNFC conference in Chicago, the first major industry conference since the Fukushima accident. Based on recent offers, the Ux U<sub>3</sub>O<sub>8</sub> Price declines this week to \$59.00 per pound, down \$3.50 for the week. It will be interesting to see the sentiment of the industry at the WNFC meeting, as the market implications of Fukushima will be a key topic discussed. As the accident continues to drag on with a dearth of encouraging news, this sentiment may be reflected by continued weakness in the spot price if this trend continues.

UxC Market Statistics				
Monthly (Mar)	Spot		Term	
	Volume	# Deals	Volume	# Deals
<b>U<sub>3</sub>O<sub>8</sub>e</b> (million lbs)	7.2	50	0	0
<b>Conv.</b> (thousand kgU)	868	11	0	0
<b>SWU</b> (thousand SWU)	0	0	W	2
2011 Y-T-D	Spot		Term	
	Volume	# Deals	Volume	# Deals
<b>U<sub>3</sub>O<sub>8</sub>e</b> (million lbs)	19.1	112	87.9	9
<b>Conv.</b> (thousand kgU)	3,088	31	W	2
<b>SWU</b> (thousand SWU)	W	1	W	4

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

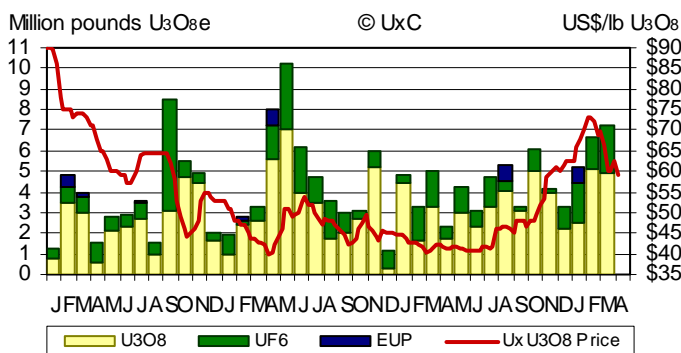
### UxC Leading Price Indicators

Three-month forward looking price indicators, with publication delayed one month. Readings as of Mar 2011.

<b>Uranium</b> (Range: -17 to +17)	<b>+3</b> [down 2 points]
<b>Conversion</b> (Range: -16 to +16)	<b>+3</b> [down 4 points]
<b>Enrichment</b> (Range: -18 to +18)	<b>+2</b> [down 1 point]

<b>Platts Forward Uranium Indicator</b>	<b>\$54.00-\$61.00</b>
A forward one-week outlook.	As of 4/4/11 (US\$/lb)

### Ux U<sub>3</sub>O<sub>8</sub> Price vs. Spot Volume by Form



### Proof of Citizenship

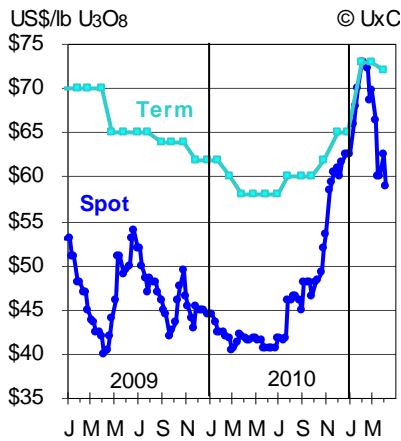
Before I could start my first job right out of college I had to present evidence that I was a U.S. citizen. I showed up with my driver's license and birth certificate.

The clerk looked at my driver's license and copied down some information. She then picked up my birth certificate and gave it a long look.

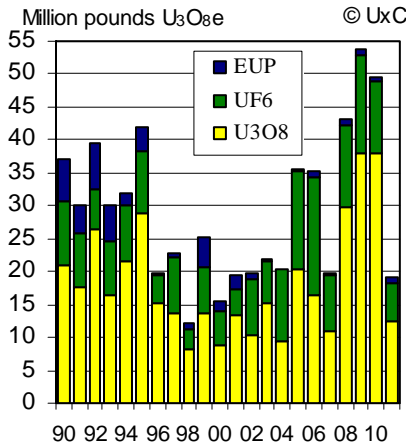
"Is anything wrong?" I asked.

"Yes," she said. "I can't find the expiration date."

## Ux U<sub>3</sub>O<sub>8</sub> Prices



## Annual Spot Uranium Volumes



## UxC Broker Average Price

The UxC Broker Average Price (BAP) realized a week of modest downward movements in the midpoint. The indicator began the week down \$1 at \$59.75 on Tuesday. After a couple of days of slight price declines, the BAP finished Friday at \$58.77, down \$0.25 on the day. Today's UxC BAP is \$58.75, down

## Ux Price Indicator Definitions

The Ux 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. The Ux U<sub>3</sub>O<sub>8</sub> Price (Spot) includes conditions for delivery timeframe (≤ 3 months), quantity (≥ 100,000 pounds), and origin considerations, and is published weekly. The Ux LT U<sub>3</sub>O<sub>8</sub> Price (Long-Term) includes conditions for escalation (from current quarter), delivery timeframe (≥ 24 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 (LT) for multi-annual deliveries with delivery in North America (NA) or Europe (EU). The Ux NA UF<sub>6</sub> Price includes conditions for delivery timeframe (6 months), quantity (50-150,000 kgU), and delivery considerations. \*The Ux NA and EU UF<sub>6</sub> Values represent the sum of the component conversion and U<sub>3</sub>O<sub>8</sub> (multiplied by 2.61285) spot prices as discussed above and, therefore, do not necessarily represent the most competitive UF<sub>6</sub> 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 Ux U<sub>3</sub>O<sub>8</sub> Price, are published the last Monday of each month. (Units: U<sub>3</sub>O<sub>8</sub> = US\$ per pound, Conversion/UF<sub>6</sub>: US\$ per kgU, SWU: US\$ per SWU, EUP: US\$ per kgU) 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.

\$0.02 on the day and down \$2 from last Monday's \$60.75. The BA Bid is \$57.75, down \$1.75 from last Monday's \$59.50 and the BA Offer is \$59.75, down \$2.25 from last Monday's \$62.

## Fund Implied Price (FIP)

Fund Implied Prices (FIP) sagged through the middle part of the week before turning back up before the weekend. Tuesday's MF Global FIP began the week down \$2.84 on Tuesday at \$53.27. The slide continued into Wednesday at \$52.34, down \$0.93 on the day. The FIP began its turnaround on Thursday at \$52.41 and again on Friday at \$55.16, up \$2.75 on the day. Today's FIP is \$54.35, down \$0.81 on the day and down \$1.76 on the week.

## U<sub>3</sub>O<sub>8</sub> Futures Market

The CME Group futures market for uranium realized some slowing this week as the market picked up 27 contracts (6,750 pounds U<sub>3</sub>O<sub>8</sub>). The week's only contracting activity was booked on Thursday, March 31, for the June 2011 contract month, but prices were not reported for the 27-contract deal. Prices for the week were generally flat with some downward pressure realized throughout the middle of the week. The week's increase in 27 contracts (6,750 pounds U<sub>3</sub>O<sub>8</sub>) brings the March monthly contract total up to 2,996 contracts (749,000 pounds U<sub>3</sub>O<sub>8</sub>) and the 2011 annum total to 6,016 (1,504,000 pounds U<sub>3</sub>O<sub>8</sub>).

Open interest remained unchanged throughout the week at 15,734 contracts (3,933,500 pounds U<sub>3</sub>O<sub>8</sub>).

## Uranium Term Market

Several utilities are currently active on the term market with both more formal requests and informal inquiries. A non-U.S. utility has offers due June 1 based on its RFP for delivery starting in 2012 and options through 2032 for both feed and EUP. Deliveries vary depending on time period options, and overall volume totals just over 2.9 million pounds U<sub>3</sub>O<sub>8</sub>e for the full request. A non-U.S. utility is evaluating offers based on its term request with multiple options, one of which involves just over two million pounds U<sub>3</sub>O<sub>8</sub> equivalent as either uranium or UF<sub>6</sub> with delivery over the 2012 to 2019 time period. Another non-U.S. utility is looking for sizeable quantities with delivery starting in 2015. A non-U.S. utility that was evaluating offers based on its request for up to 600,000 pounds U<sub>3</sub>O<sub>8</sub> per year in 2011 and 2012 has made its decision. Several other utilities also continue to evaluate off-market requests, including mid-term delivery.

## Conversion & Enrichment

As noted above, a non-U.S. utility is awaiting offers that included feed and EUP options. Conversion services involved in this request total about 1.12 million kgU. The enrichment portion totals about 850,000 SWU.

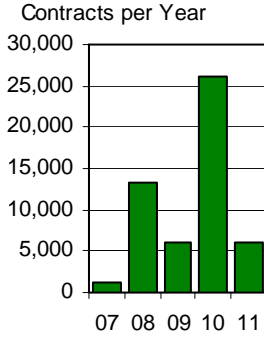
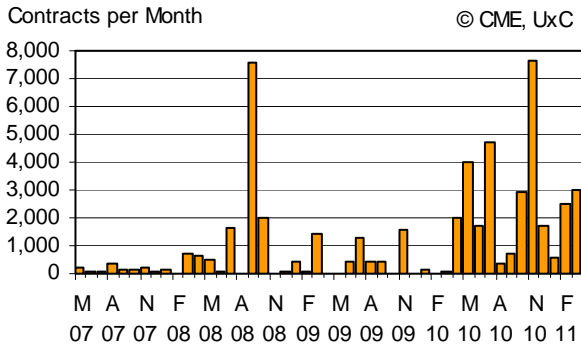
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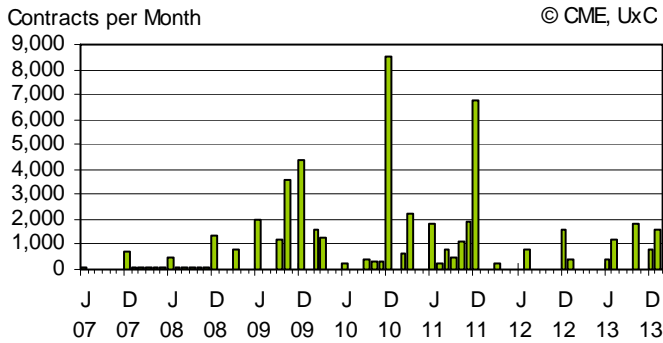
**The Ux Consulting Company, LLC**  
 1501 Macy Drive  
 Roswell, GA 30076, USA  
 Phone: +1 (770) 642-7745  
 Fax: +1 (770) 643-2954  
 Internet: <http://www.uxc.com/>

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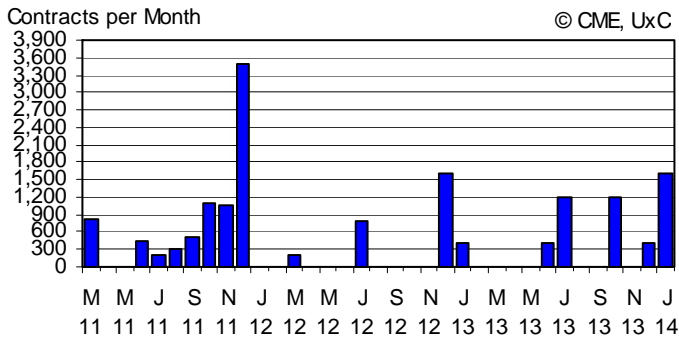
### NYMEX UX Futures Activity Total Contracts by Transaction Month, by Transaction Year



### Total Contracts by Settlement Month



### Open Interest by Settlement Month

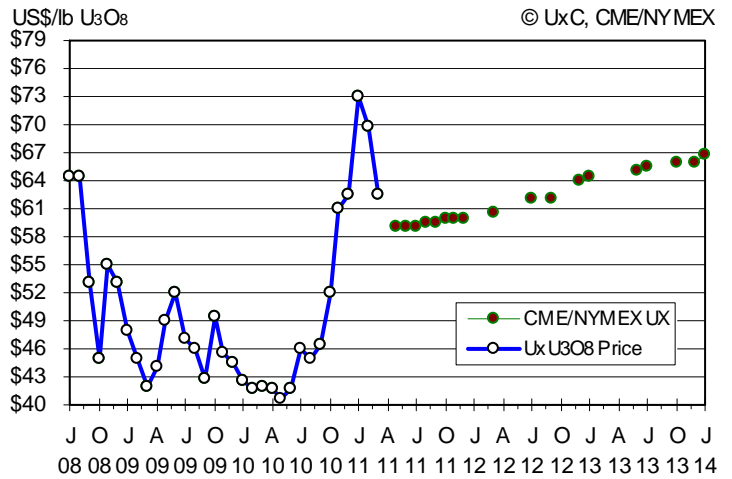


### CME UxC Uranium U<sub>3</sub>O<sub>8</sub> (UX) Futures

#### Activity as of March 25, 2011

Settlement	Price	Volume	Open
Feb 2011	\$69.75	600	N/A
Mar 2011	\$62.50	2,203	831
May 2011	\$59.00	5	5
Jun 2011	\$59.00	1,849	446
Jul 2011	\$59.00	202	200
Aug 2011	\$59.50	800	300
Sep 2011	\$59.50	500	500
Oct 2011	\$60.00	1,101	1,100
Nov 2011	\$60.00	1,919	1,057
Dec 2011	\$60.00	6,800	3,491
Mar 2012	\$60.50	200	200
Jul 2012	\$62.00	800	800
Sep 2012	\$62.00	1	1
Dec 2012	\$64.00	1,601	1,600
Jan 2013	\$64.50	400	400
Jun 2013	\$65.00	400	400
Jul 2013	\$65.50	1,200	1,200
Oct 2013	\$66.00	1,800	1,200
Dec 2013	\$66.00	803	403
Jan 2014	\$66.75	1,600	1,600
*From May 2007	<b>Totals:</b>	<b>52,644*</b>	<b>15,734</b>

### Ux U<sub>3</sub>O<sub>8</sub> 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 MF Global (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 over a three-month forward period. This period is consistent with the three-month delivery period for offers considered in the determination of the Ux U<sub>3</sub>O<sub>8</sub> 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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### Ux U<sub>3</sub>O<sub>8</sub> Price vs. UxC Broker Average Price (BAP)

