

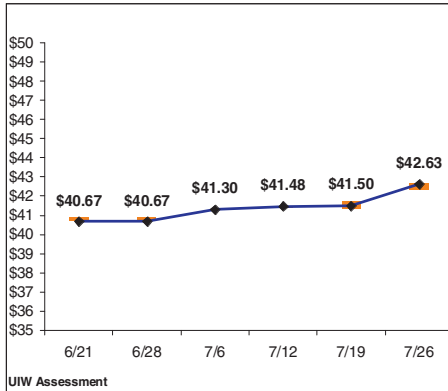


# URANIUM INTELLIGENCE WEEKLY

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## UPP: \$42.63/lb U3O8



The Uranium Price Panel (UPP) represents the average price assessment reported by active spot market participants for a transaction of 100,000 lbs of U3O8 by book transfer on the date given. Bars represent the range of conceivable final averages that might result when random elimination is used to balance market positions within the panel.

## WEEKLY ROUND-UP:

### Prices Move Higher — Even for Conversion

- **The Uranium Price Panel is moving the spot price higher, to \$42.63/lb U3O8 for last week, while conversion prices take an even bigger leap upward (p2).**
- **China is making waves in the global enrichment market just by sheer virtue of its presence — as a seller.** Marketing in both the US and Asia is apparently part of a long-term strategy to become a major player. The question on its competitors' minds is this: Where is the enriched uranium product (EUP) coming from (p3)?
- **China is also adding to its domestic uranium supply with the commissioning of a new mine, called Shaoguan, in the southeastern province of Guangdong, according to information supplied by the China National Nuclear Corp.** Shaoguan is one of China's larger uranium mines, with nominal annual output of 160 metric tons of contained uranium (p4).
- **Canada and Australia are still finding inexpensive uranium, but elsewhere uranium mining looks set to become more expensive.** The latest *Red Book* report compiled by the International Atomic Energy Agency and the Nuclear Energy Agency says there is more uranium to be mined, but only if you count a new cost recovery category of \$50-\$100/lb U3O8 (p4).
- **The European Union and Canada today adopted tough sanctions against Iran over and beyond what was agreed earlier this year by the UN Security Council.** While it isn't immediately clear how broad the new sanctions will be, they target the energy, transport and financial service sectors, and implement specific visa bans and asset freezes. Announcing the measures, the EU stated that the sanctions were adopted "with a view to supporting the resolution of all outstanding concerns regarding Iran's development of sensitive technologies in support of its nuclear and missile programs, through negotiation." Tehran reiterated its willingness to resume talks about a proposed nuclear fuel swap deal (UIW Jul.12,p5). "Iran is ready to go back to the negotiating table" quickly to discuss exchanging some of its enriched uranium for fuel rods for Tehran's nuclear reactor, Ali Ashgar Soltanieh, Tehran's senior envoy to the IAEA, told reporters today in Vienna.
- **At the same time, Iran's efforts to boost uranium production are hitting roadblocks — and the country's plans for new reactors also appear to be decelerating.** Start-up of the Saghand mine and associated Ardakan mill, the country's largest yellowcake project, has been pushed back three years to 2012. Meanwhile, instead of 6,000 MWe in nuclear generating capacity by 2016, the Iranians will basically have only a single 915 MWe unit at Bushehr (p6).
- **If the US Senate Appropriations Committee has its way, nuclear loan guarantees will be more than two thirds less than what the Obama administration requested.** The committee's Department of Energy spending bill would also allow the DOE to barter uranium in exchange for accelerated cleanup services at the old enrichment plant near Piketon, Ohio (p6). ☼

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# MARKET

## Spot U308 Price Rises, Spot Conversion Price Spikes

The Uranium Price Panel (UPP) returned a spot price of \$42.63/lb U308 for last week, up from \$41.50/lb the previous week, as buyers move to take advantage of recent low prices. The UPP's weekly price assessment has been rising steadily since a low point of \$40.50 in late May.

Meanwhile, Honeywell's Metropolis conversion plant, which is now being operated by salaried and replacement employees since management locked out its unionized workers over a contract dispute, still isn't producing UF6 and may not be able to start for weeks. The spot conversion price, which ranged from \$6 to \$7.50/kgU in June, according to UIW's assessment, has jumped dramatically — one source reported a transaction at \$11/kgU.

Utility buyers are downplaying the significance of the situation, though, arguing that ConverDyn, which markets Honeywell's UF6, saw the disruption coming and worked with utilities to plan for it. "I do not believe that utilities are panic-stricken because of Metropolis," a buyer said. "Based on my impression, it's something that's going to come to a halt quickly." He said the spot conversion price had been rising in response to the increasing spot U308 price.

Sellers, however, argue that the situation is serious. One said the buyers were just "putting on a brave face, but how do you predict how long a strike will go on?" The situation reportedly forced at least one utility into the market who, according to one source, "paid a pretty penny." (That might have been the \$11 transaction referred to earlier). Furthermore, the spot conversion price increase is a lot greater than the upward movement of the spot U308 price. Says a seller: "I think it's really driven by the Metropolis situation."

The next round of talks between Honeywell and the union are set for Tuesday. Sen. Dick Durbin, Democrat of Illinois, has urged the two sides to come to an agreement as soon as possible, to get the union members back to work, but also because he is "concerned that the residents of Massac County [where the plant is located] are being put at risk because nuclear chemicals are now being handled by workers unfamiliar with that Honeywell plant," he wrote in a Jul. 7 letter.

According to a letter posted by plant Manager Larry Smith on Jun. 28, the plant lost \$9 million last year and is on track to lose \$20 million this year, as costs have increased and production has declined. "In the current situation, the site could lose as much as an additional \$2 million a week," he wrote. Honeywell, however, last week reported its net income for second-quarter 2010: \$172 million, up 3.6% from \$166 million for second-quarter 2009.

## Cameco Continues Buying and PPL Jumps In, Too

Several buyers got bids back last week on RFQs. Taipower reportedly received just two offers for the 300,000 lbs of spot U308 it wants and UIW has conflicting reports about the result: one source said the bidding process had been canceled, another said he expected Taipower to declare both bids too high and ask for a rebid, and a third said Taipower had awarded the contract to one of the bidders. No word yet on the results of PSE&G's uranium RFQ, or Fuelco's enrichment RFQ (UIW Jul.19,p2).

PPL issued an RFQ last week for 40 tons of UF6, a move that was seen by market sources as unconnected to the Metropolis situation. Also, UIW reported last week that Cameco has been buying in small quantities of less than 100,000 lbs U308 (UIW Jul.19,p2). Now market sources say Cameco's purchases in recent weeks total 400,000 lbs at prices ranging from \$41.50/lb to \$43/lb.

## Usec Ships UF6 to Kansai and Kyushu

The US Nuclear Regulatory Commission issued an export license last week authorizing Transport Logistics International (TLI) to send 13,642 kgs of 4.05% enriched UF6 to Mitsubishi Nuclear Fuel in Japan between now and Jul. 1, 2013 for re-conversion, fabrication and delivery to Kansai Electric Power Co. for use in Mihama Units 2 and 3 and/or Takahama Units 1 and 2. The uranium is Australian and was enriched by Usec.

The NRC also approved an export license last week for TLI to send 8,782 kgs of 4.85% enriched UF6 to Mitsubishi Nuclear Fuel in Japan between Aug. 1, 2010 and Aug. 1, 2013, for re-conversion, fabrication and delivery to Kyushu Electric Power for use in its Genkai Nuclear Power Station and/or its Sendai Nuclear Power Station. The uranium is American and was enriched by Usec. ☼

## URANIUM PRICE PANEL

For the week ended July 23, 2010

### Weekly Spot Market Prices

	Change	Jul.						Jun.						May			
		26	19	12	6	28	21	14	7	1	24	17	10	3			
Price (\$/lb U3O8)	1.13	42.63	41.50	41.48	41.30	40.67	40.67	40.69	40.50	40.50	41.13	41.63	41.63	41.56			
Total Assessments	1.00	14.00	13.00	14.00	13.00	15.00	14.00	13.00	13.00	14.00	13.00	11.00	12.00	12.00			
% within 1 StDev	24.18	85.71	61.54	78.57	76.92	80.00	71.43	84.62	76.92	78.57	84.62	45.45	91.67	91.67			
Low (\$/lb U3O8)	0.75	42.00	41.25	41.00	41.00	40.50	40.50	40.50	40.50	40.25	40.50	41.25	41.50	41.00			
High (\$/lb U3O8)	1.50	43.50	42.00	42.00	42.00	41.50	41.50	41.00	41.50	40.75	41.75	41.75	41.75	42.00			
Variability*	0.00	0.38	0.38	0.08	0.00	0.25	0.25	0.25	0.50	0.31	0.00	0.00	0.50	0.00			

The Uranium Price Panel (UPP) represents the average price assessment reported by active spot market participants for a transaction of 100,000 lbs of U3O8 by book transfer on the date given. In the UPP, participants are assigned a market position of seller, buyer or intermediate. Each week Energy Intelligence eliminates assessments that are statistical outliers, and double-checks the market position of intermediates. It then uses random elimination to maintain an equal number of buyer and seller assessments in the final average. "Variability" represents the absolute range of conceivable final averages resulting from this random elimination. "High" and "Low" assessments represent the extremes of the non-eliminated market assessments. For a detailed explanation of the price panel methodology, see [www.energyintel.com](http://www.energyintel.com).

## China Enters Enrichment Market — As a Seller

China has been hawking enrichment in the US and Asia lately, in what is apparently part of a long-term strategy to become a major competitor in the global enrichment market. The question on its competitors' minds is this: where is this enriched uranium product (EUP) coming from?

In the US, Chinese sellers approached a utility about a year ago offering 100,000-200,000 SWU for four years, but the two sides couldn't agree on a price. Now, Cameco is said to be marketing Chinese EUP to US utilities. In Asia, China is said to be selling long-term enrichment contracts. One source said China has already inked a 10-year supply deal with Korea.

"I think it's a way for them it get information and experience," a market source said of the sales.

They're starting slow, market sources say, selling small quantities. But their long-term strategy is much grander: they see a future in which large amounts of Kazakh and Australian yellowcake flow through Chinese conversion and enrichment plants, on the way to markets in Asia, North America and elsewhere. Few doubt that China can ultimately achieve this; the real question is how fast it is moving toward its goal.

China's recent sales seem to offer some hints. In the past, it has made short-term EUP sales in the US. What's generating buzz now is that it's offering long-term contracts. That has many minds in the market wondering how China can have excess enrichment in the long-term, given its exploding domestic demand. "I thought they'd have a hard time keeping up with their own growth," a source said, much less becoming an exporter.

China has enrichment supply contracts with Tenex, Areva and Urenco, and several market sources speculated that China might simply be reselling Russian enrichment. One market source, however, discounted this, telling UIW that while the Chinese had asked for the right to re-export Russian EUP, Russia refused to allow it. It is unlikely that the other two companies are allowing resales, either. The "instinct of self-preservation should have inspired SWU suppliers to pose restrictions on re-export in the LT [long-term] contracts," a source said. Assuming it's not breaking contractual agreements by reselling EUP purchased from SWU suppliers, China's probably selling its own enrichment.

But, even if China signed contracts with foreign suppliers to cover all of its own needs (which are projected to top 10 million SWU by 2020), and sold all of its domestic enrichment into the market, it still would not be a major player — at this point. It has two known centrifuge enrichment plants, both built by Russia, in Shaanxi and Gansu provinces. Reports of their capacities conflict. Some point to a capacity of 500,000 SWU at each and another 500,000 SWU scheduled to come on line soon at Shaanxi, for a total Chinese capacity of roughly 1.5 million SWU (UIW May11'09,p8). Others say China has 1.5 million SWU already, and is expanding to 2 million SWU soon.



Either way, the figure is small, so if China's going to become a major player in the enrichment market, a further expansion would be necessary. This, sources say, is the plan. Reports coming out of China appear to confirm this.

In a 2009 interview, Shaanxi Nuclear Enrichment Co. General Manager Shi Qingfeng told reporters that one expansion project at his plant was due to be complete by 2011, which is about when the next 500,000 SWU the Russians are building is supposed to come on line. He also said that another expansion project at the plant should be finished by 2013. "By then, the company's production will quadruple," he said, according to the Shaanxi Worker newspa-

per. "We must go out, aiming at the international market, to participate in international competition."

China National Nuclear Co.'s website for Shaanxi Nuclear Enrichment Co. says the company plans to put a new module into production in 2011 and is "actively planning for a follow-up expansion project," which "will greatly enhance our company's production scale and economic efficiency, and promote our company to enter the international market." This may explain rumors about a mysterious construction project near one of the enrichment existing plants.

Although China hired the Russians to build the centrifuge plants in Shaanxi and Gansu, many believe that it has reached the point in its own program that it could build additional capacity without external assistance. After all, it has been working on centrifuge technology for decades, with presumed input from the former Soviet Union, Pakistan and other sources. Now some worry that the Chinese may have breached the "black-box" protections on the Shaanxi and Gansu plants to replicate Tenex centrifuges, although others argue the Russians engineered their centrifuges in a way that makes that impossible. ☹

Sam Tranum, Washington and Phil Chaffee, London

## China Reports New Uranium Mine

China appears to have commissioned a new uranium mine, called Shaoguan, in the southeastern province of Guangdong, according to information supplied by the China National Nuclear Corporation (CNNC) to compilers of the Red Book.

The Shaoguan mine, which began operating in 2007 or 2008, has a nominal annual production capacity of 160 metric tons of contained uranium (416,000 lbs U3O8), making it one of the larger of China's uranium operations. It appears to be exploiting the Chengxian deposit some 200 kilometers north of Guangzhou. According to CNNC, which is responsible for China's entire domestic fuel cycle, the Shaoguan operation is an underground mine with an associated acid heap leach processing plant. It mines some 400 metric tons of ore per day, with an average mining recovery rate of 90%.

With Shaoguan, China now reports some 1,200 tU (3.12 million lbs U3O8) in total nominal uranium production capacity. This doesn't mean that output has reached this level yet. The underground Qinglong uranium mine in Liaoning province, which started in 2007, has yet to achieve its design capacity of 100 tU "due to longer-than-expected heap leach cycles, especially in the winter." And at the Yining ISL operation in the western province of Xinjiang, pilot tests and "hydro-geological tests" are under way in an attempt to reach design capacity of 300 tU per year.

Beyond these existing production issues, China is also preparing another 550 tU (1.43 million lbs U3O8) in production through expansion of existing operations in Jiangxi, near Guangdong,

and Xinjiang. Although there is no public schedule for this expansion, it would bring total domestic uranium production capacity up to 1,750 tU (4.55 million lbs U3O8).

"New production centres" at the Fouzhou and Chongyi uranium mines, both in Jiangxi, remain "under construction," said the 2009 Red Book. The new Chongyi operation will be situated in a different location, said the report.

Meanwhile, China plans to expand production at its Yining ISL operation on the Kazakh border by tapping further into its Yili uranium deposit which, at 26,000 tU of identified resources, is the country's second-largest. The deposit has been mined since 1993. But the Red Book reports that ISL "pilot tests at the Shihongtan deposit of Yining production centre are ongoing." In a 2009 presentation given to an IAEA conference by Weike Cong, the CNNC official indicated that there will be another 200 tU mine at the Yili deposit — possibly Shihongtan. ☼

Phil Chaffee, London

### China's Uranium Mines

Facility	Province	Type*	Commissioned	Identified Reserves (tU)	Capacity (tU)	Planned Capacity (tU)
Benxi	Liaoning	UG	1996	?	120	-
Chongyi	Jiangxi	UG	1979	12,000	120	150
Fuzhou	Jiangxi	UG	1966	26,000	300	200
Lantian	Shanxi	UG	1993	2,000	100	-
Qinglong	Liaoning	UG	2007	8,000	100	-
Shaoguan	Guangdong	UG	2007/2008?	5,000	160	-
Shihongtan	Xinjiang	ISL	-	?	-	200
Yining (Yili Basin)	Xinjiang	ISL	1993	16,000	300	-
<b>Total</b>				<b>171,400</b>	<b>1,200</b>	<b>550</b>

\*UG refers to an underground mine, and ISL refers to in situ leach.  
Source: IAEA/INEA 2009 Red Book; CNNC statements; UIW estimates.

## Global Uranium Resources More Costly

The world's uranium reserves are plentiful — still — but getting more expensive to mine. That's the upshot of the latest Red Book report, which was only able to report an increase in reserves by adding a new price range for recovery, from \$50 to \$100/lb U3O8. In the under \$50/lb category, global reserves remained static or diminished, with two notable exceptions — Canada and Australia. Kazakhstan, not surprisingly, failed to buck the general trend.

There was no scrimping on the global search for uranium either. Worldwide exploration and mine development expenditures in 2008 were up 133% over 2006, to \$1.6 billion, but the massive effort failed to turn up any further lower-cost uranium, according to the report, formally called Uranium 2009: Resources, Production and Demand, by the International Atomic Energy Agency (IAEA) and Nuclear Energy Agency (NEA). In fact, the amount of global identified uranium reserves recoverable at under \$15/lb U3O8 plummeted 73% (see table).

Australia saw enormous growth in its identified reserves, and solidified its lead as the world's largest uranium posses-

sor. It now accounts for 27% of global reserves (under \$100/lb), more than twice those of second-place Kazakhstan.

It's important to note that the 2009 Red Book updates global reserve data as of Jan. 1, 2009, reflecting developments in 2007 and 2008. The uranium price peaked in the spring of 2007, and then fell almost as dramatically as it had risen several years earlier. What follows is a summary of the report's highlights.

### Australia

Through dramatic gains, Australia's resources pushed north in every category, with the bulk extractable at under \$31/lb. Much of this trend-bucking comes from BHP-Billiton's Olympic Dam, which saw a doubling of resources in all categories in June 2008 to 8.34 billion metric tons U3O8. The deposit's under-\$31/lb Reasonably Assured Resources (RAR) alone are 884,400 tU, or "30 percent of the world's total resources in this category." (RAR is the highest confidence category, and together with Inferred Resources, make up Indicated Resources.)

Beyond Olympic Dam, significant new resources were identified at Rio Tinto's Ranger deposit in North Australia,

and at the Four Mile deposit in South Australia, where a Heathgate Resources subsidiary is building a mine.

Much of the remaining uranium recoverable at under \$31/lb is found at Jabiluka and Koongarra, both near Ranger, and at Cameco's Kintyre and BHP Billiton's Yeelirrie, both in Western Australia. It's not clear how much of this could be extracted at under \$15/lb as Australia's data did not break this out.

## Kazakhstan

Now the world's largest uranium producer, Kazakhstan has for much of the past decade been renowned for its cheap uranium. But as multiple observers have long warned, the best reserves are already being exploited. What's left to develop may be less attractive; Kazakhstan's identified resources recoverable at under \$15/lb fell 91% to 44,400 tU, according to the latest Red Book.

And that was in spite of a massive exploration effort: In 2008 the nongovernment uranium industry in Kazakhstan spent over five times on exploration what it had two years earlier. It drilled 693 holes in the ground, compared to 607 holes in 2006. The results weren't promising: Primarily they led to reclassification of reserves to higher-cost categories, and the actual identified resources under \$50/lb fell by 20%, with losses in the under \$31/lb category outpacing impressive gains (up 168% to 176,400 tU) in the \$31-\$50/lb category. Even more identified uranium resources, 183,000 tU, were in the \$50-\$100/lb category.

A slim majority of Kazakh uranium resources are still cheap: 431,000 tU, or some 51% of reserves extractable at under \$100/lb U3O8, are in the low-cost category of \$15 to \$31/lb. With uranium fixed at just above \$40/lb U3O8, there is still much for Kazakh producers to smile about.

## Canada

Long known as uranium's Saudi Arabia, Canada is now surpassed by Kazakhstan in terms of annual output and by Australia, Kazakhstan and Russia in terms of uranium reserves. But the country has continued to increase its indicated reserves, and pushed them 15% higher in the under \$50/lb cost category. "This increase in identified uranium resources," the 2009 Red Book explained, "is primarily due to junior mining companies reporting National Instrument (NI) 43-101 compliant resource assessments for deposits which were discovered in the 1970s and 1980s and are being re-examined as a result of higher uranium prices."

The vast majority of Canada's identified reserves are in the cheapest production category — under \$15/lb — and are in "existing or committed" production centers in Saskatchewan's Athabasca Basin. But 2007 and 2008 saw significant exploration in other provinces, including the Northwest Territories, Nunavut, Quebec, and Labrador. Canadian exploration efforts seem particularly sensitive to the uranium price, as they pushed up to CA\$413 million (US\$421 million) in 2007 before falling to CA\$207 million (US\$197 million) in 2009.

## Russia

Like Kazakhstan, Russia saw a significant drop in its identified uranium resources under \$50/lb. Much of this came, it seems, from a "comprehensive technical and economic re-evaluation of uranium deposit resources" undertaken in the two years to 2008. The result was a complete elimination of resources in the lowest cost category, and a dramatic shift to the \$31-50/lb range where the vast majority of the country's resources now sit.

The re-evaluation, like the 2009 Red Book itself, led to the addition of resources in the \$50 to \$100/lb range. It's unclear, however, if Russian miner Atomredmetzoloto is actually willing to develop Russia's 86,000 tU of identified uranium resources in that category with spot prices where they are now.

### Top Reserves of Identified Uranium Recoverable at Under \$100/lb U3O8 and Under \$50/lb U3O8 (tU)\*

Country	2009 <\$100/lb U3O8	% of Global Reserves	2009 <\$50/lb U3O8	% Chg. 2009 over 2007	2007 <\$50/lb U3O8	% Chg. 2007 over 2005	2005 <\$50/lb U3O8
Australia	1,679,000	27%	1,673,000	35%	1,243,000	9%	1,143,000
Kazakhstan	832,100	13	651,800	-20	817,300	0	816,099
Russian Federation	566,300	9	480,300	-12	545,700	217	172,402
Canada	544,600	9	485,300	15	423,200	-5	443,800
United States	472,100	7	207,400	-39	339,000	-1	342,000
South Africa	295,600	5	295,600	-32	435,100	28	340,596
Namibia	284,200	5	284,200	37	207,300	-27	282,359
Brazil	278,700	4	278,700	0	278,400	0	278,700
Niger	275,500	4	272,900	12	243,100	8	225,459
Ukraine	223,600	4	105,000	-47	199,500	122	89,836
China	171,400	3	171,400	152	67,900	14	59,723
Uzbekistan	114,600	2	114,600	3	111,000	-4	115,526
Jordan	111,800	2	111,800	0	111,800	-	0
Denmark	85,600	1	0	-100	32,300	0	32,250
India	80,100	1	80,100	10	72,900	12	64,840
Mongolia	49,300	1	49,300	-20	62,000	0	61,950
Tanzania	28,400	0	0	-	0	-	0
Algeria	19,500	0	19,500	0	19,500	0	19,500
Argentina	19,100	0	19,100	59	12,000	-23	15,640
Malawi	15,100	0	15,100	30	11,600	32	8,775
<b>Total†</b>	<b>6,306,300</b>		<b>5,404,000</b>	<b>0%</b>	<b>5,430,700</b>	<b>15%</b>	<b>4,734,290</b>

\*Identified refers to uranium deposits delineated by sufficient direct measurement to conduct pre-feasibility and sometimes feasibility studies, and equals Reasonably Assured Resources together with Inferred Resources. †Totals include resources from countries not listed in this list condensed for UIW.

Source: NEA/IAEA Red Books from 2005, 2007, 2009. UIW calculations.

## United States

Despite a resurgence of interest in its Western states, the US yellowcake industry remains a minor player globally. If prices were to push above \$100/lb U3O8, however, the potential is enormous. The US has more resources — 264,700 tU — in the \$50-\$100 category than any other country, according to the report. (And the US reports only RAR reserves.)

Like other countries, much of the gain in the higher-cost category was due to reserve reclassification — the first for the US since the 2003 Red Book. This resulted in a 61% drop in the under \$31/lb category. The reclassification, said the report, was based “on a revised examination of major US properties, taking into account increases in mining costs, published reassessments of current resources, newly assessed properties and mine depletion. In general, higher mining costs over the past several years have resulted in resources being shifted from lower-cost to higher-cost categories.”

## China

While it is far down the list of the countries with exploitable uranium reserves, China aggressively expanded its exploration effort, which appears to have paid off. China’s resources increased 152% in the under-\$50/lb category, more than any other country among the top 20 with highest overall reserves.

### Profile of Global Identified Reserves (tU)

	2009	% Chg. '09-'07	2007	% Chg. '07-'05	2005
<b>Global</b>					
<\$15/lb U3O8	796,500	-73%	2,970,000	8%	2,746,380
\$15-\$31/lb U3O8	2,945,400	102	1,461,600	39	1,049,346
\$31-\$50/lb U3O8	1,662,100	66	999,100	6	938,564
\$50-\$100/lb U3O8	902,300				
<b>Australia</b>					
<\$15/lb U3O8	1,612,000	33	1,196,000	15	1,044,000
\$15-\$31/lb U3O8			20,000	-33	30,000
\$31-\$50/lb U3O8	61,000	126	27,000	-61	69,000
\$50-\$100/lb U3O8	6,000	-	-	-	-
<b>Kazakhstan</b>					
<\$15/lb U3O8	44,400	-91	517,300	27	408,092
\$15-\$31/lb U3O8	431,000	84	234,300	18	198,566
\$31-\$50/lb U3O8	176,400	168	65,700	-69	209,441
\$50-\$100/lb U3O8	180,300	-	-	-	-
<b>Canada</b>					
<\$15/lb U3O8	366,800	4	352,400	-5	371,800
\$15-\$31/lb U3O8	80,600	14	70,800	-2	72,000
\$31-\$50/lb U3O8	37,900	-	0	-	0
\$50-\$100/lb U3O8	59,300	-	-	-	-
<b>Russia</b>					
<\$15/lb U3O8	0	-100	83,600	6	79,102
\$15-\$31/lb U3O8	158,100	-62	411,800	341	93,300
\$31-\$50/lb U3O8	322,200	541	50,300	-	0
\$50-\$100/lb U3O8	86,000	-	-	-	-
<b>United States</b>					
<\$15/lb U3O8	0	-	0	-	0
\$15-\$31/lb U3O8	39,000	-61	99,000	-3	102,000
\$31-\$50/lb U3O8	168,400	-30	240,000	0	240,000
\$50-\$100/lb U3O8	264,700	-	-	-	-
<b>China</b>					
<\$15/lb U3O8	67,400	72	39,300	24	31,681
\$15-\$31/lb U3O8	82,600	265	22,600	-19	28,042
\$31-\$50/lb U3O8	21,400	257	6,000	-	0
\$50-\$100/lb U3O8	0	-	-	-	-

Note: UIW calculations.

Source: NEA/IAEA Red Books from 2005, 2007, 2009.

The Chinese government increased its domestic exploration expenditures by 57% from 2006 to 2008, and added reserves in all cost categories except the most costly. ☼

Phil Chaffee, London

## Iran Reveals Nuclear Delays

Iran’s uranium production efforts have met multiple delays, according to the 2009 Red Book released last week. Start-up of the Saghand mine and associated Ardakan mill, comprising the country’s largest yellowcake project, have been pushed back three years to 2012. The “entire mine development project” was reported to be “about 56% complete” at the end of 2008.

This appears to be in line with a May report from the International Atomic Energy Agency based on satellite imagery that “construction activities are continuing” at Ardakan while the underground Saghand mine “does not appear to be in operation” (UIW Jun.1,p8). Once operational, the mine and mill will have a targeted output of 50 tU (roughly 130,000 lbs U3O8) per year.

Meanwhile, the operational Gachin plant, which mills ore from the open-pit Bandar Abbas uranium mine, is producing well below its 21 tU (roughly 55,000 lbs U3O8) per year design capacity. Total output from Gachin was just over 45,000 lbs U3O8 from 2006 through the end of 2008; it was expected to produce 26,000 lbs U3O8 in 2009.

Despite the delays, Iran appears to be picking up its efforts to produce uranium. In 2008 the government spent only 24.1 billion Iranian rials (\$2.4 million) on development, but this was expected to increase to 92 billion rials (\$9.1 million) in 2009. Exploration output picked up substantially as well, with a focus on the southeast and east of Iran.

The Atomic Energy Organization of Iran (AEOI) also revised downward its dramatic nuclear power plans, according to information it submitted for the Red Book. Two years ago, the AEOI forecast nuclear generating capacity of 6,000 MWe in 2016 and 16,000 MWe in 2026; this year’s report predicts only 915 MWe by 2015 (representing the Bushehr reactor now being completed by Atomstroyexport), a maximum of 5,075 MWe by 2020, and 7,925 MWe by 2025. ☼

Phil Chaffee, London

## Senate Committee OKs DOE Uranium Barter for FY2011

The Senate Committee on Appropriations on Thursday approved a version of the fiscal year 2011 Energy and Water Appropriations bill that would allow the Department of Energy (DOE) to barter uranium in exchange for accelerated cleanup services at the old enrichment plant near Piketon, Ohio. The bill also cuts by more than two-thirds — from \$36 billion to \$10 billion — the loan guarantee authority for nuclear power plants that the Obama administration had requested.

Obama’s DOE earlier this year asked Congress for \$225 million in regular appropriations for the Portsmouth cleanup, and

authorization to collect another \$183.7 million for the project by forcing utilities to pay into the Uranium Decontamination and Decommissioning Fund (UIW Feb.1,p3). The Nuclear Energy Institute (NEI) has been fighting that proposal, and has so far managed to keep the utility fee out of both the House and Senate versions of the Energy and Water Appropriations bill.

That has left the Portsmouth project facing a major funding cut in FY-11, which begins in October. Sen. George Voinovich, Republican of Ohio, said DOE spent \$480 million on the project in FY-10; the House proposed appropriating \$245 million for the work in FY-11 and the Senate offered \$265 million.

Voinovich last week complained that it was not enough, arguing that continuing the cleanup project at an accelerated pace would support jobs now and save money in the long term. Apparently, Voinovich was persuasive: During Thursday's meeting, the committee members agreed to attach a "manager's amendment" to the bill, which included language allowing DOE to continue trading uranium for additional cleanup work at Portsmouth.

The amendment says DOE can't "transfer, barter, distribute, or otherwise provide more than 3.3 million pounds of natural uranium equivalent" from its inventory, except for initial cores — the same limit set in the DOE's 2008 excess uranium inventory management plan. The amendment also requires the DOE to notify the House and Senate appropriations committees at least 30 days in advance of the amount of uranium it plans to unload, as well as the estimated market value, the expected "date of provision," and the recipient.

For those trying to guess whether DOE uranium will hit the market in FY-11, the Senate committee's amendment provides little clarity. First, it may not make it into the final bill that will go before the full Congress. Second, it conflicts with statements from DOE officials, who want Congress to appropriate cash for the cleanup in order to avoid further uranium bartering.

## Loan Guarantees

In addition to the uranium-bartering provision, the Senate committee's bill also includes \$100 million in funding for \$10 billion in nuclear loan guarantees. The NEI warned last week that while the provision would "enable more reactors to be built," it would not be enough to "enable a broad rebirth of the industry that would foster a deep expansion of our domestic nuclear manufacturing base."

Some committee members also complained about the lower volume of loan guarantee authority provided in the bill: it is \$26 billion less than President Obama asked for, and \$15 billion under the amount in the House bill (UIW Jul.19,p3). Senators Byron Dorgan, Democrat of North Dakota, and Bob

Bennett, Republican of Utah, the leaders of the subcommittee that crafted the bill, both said they were sorry that they couldn't find more for loan guarantees, but pleaded poverty.

"It's not for lack of desire," Dorgan said. Explained Bennett: "I'd like [the figures] to be larger than they are, but there are budget constraints and [the] Congressional Budget Office [CBO] has some scoring conventions that make it impossible for us to do anything other than what we did." The CBO stipulates that Congress must appropriate \$1 for every \$100 of nuclear loan guarantee authority that it grants; its formula is based on expectations that the DOE will underestimate the guarantees' cost (UIW May3,p4).

Dorgan pointed out that a war supplemental bill currently under consideration in Congress would fund an additional \$9 billion in DOE-guaranteed reactor loans for FY-10. The House and Senate have been fighting over that legislation for months, bouncing different versions back and forth between the chambers. It seems certain that the bill will pass, eventually: Defense Secretary Robert Gates has said that if it doesn't, he'll have to stop paying troops in Iraq and Afghanistan, and Congress is unlikely to let that happen. But it is less clear whether the final version will include the nuclear loan guarantees. When Dorgan on Thursday pointed to the \$9 billion of loan guarantees in the supplemental, Voinovich replied: "I wish I was as positive as you are about the supplemental."

By the time the bill reached the committee's public markup on Thursday, nearly all disputes had been resolved, either in subcommittee or behind the scenes. So, the senators on the committee spent most of the meeting praising each other for their hard work. The only real dissenter was Sen. Patty Murray, Democrat of Washington, who wants to get nuclear waste from Hanford out of her state as soon as possible.

Bucking her party, she introduced an amendment to appropriate \$100 million for continuing the Yucca Mountain licensing process, in hopes the project would eventually be revived by the courts or a change in the political climate. But Dorgan argued that "It's not good policy to tie up a couple of hundred million waiting for this thing to play out," and Murray's amendment failed on a near-party-line vote, with all the panel's Republicans except Bennett supporting it and all the Democrats except Murray opposing it.

Thursday's Senate Appropriations Committee vote was just one of many steps toward a final FY-11 Energy and Water Appropriations bill, so the legislation could change substantially before it becomes law. Still to come: a House Committee on Appropriations markup meeting next week; full House and Senate consideration of the bills reported from the committees; reconciliation of the chambers' competing bills; and Obama's signature. ☻

Sam Trantum, Washington

## AUSTRALIA

BHP Billiton's Olympic Dam mine is back in full production as expected after its Clark Shaft returned to service during the June quarter, the Australian company announced last week. The Clark Shaft, which usually hauls some 80% of the mine's ore, was the site of a dramatic accident Oct. 6 that resulted in plunging output over the subsequent eight months (UIW Oct.12'09,p3). Both mining output and BHP's uranium sales took an enormous hit; in the first half of the year production fell 41% over the equivalent period in 2009, while sales dropped 96%, from 15.6 million lbs U3O8 in first-half 2009 to 670,000 lbs U3O8 through June of this year. The production decline was most dramatic in the March 2010 quarter, which at 196,000 lbs U3O8, was just over 10% of first-quarter 2009 output. With the Clark Shaft coming back into operation in the second quarter, production picked up to 1.57 million lbs U3O8.

## INDIA

India should not try to link a decision to join the Convention of Supplementary Compensation (CSC) with its nuclear liability bill, Nuclear Power Corp. of India Ltd. (NPCIL) chairperson P.K. Iyengar told the parliamentary panel looking into the legislation. The former Department of Atomic Energy (DAE) secretary also said he favored putting equipment liability provisions within contracts with foreign suppliers rather than in the legislation, according to the Indian Express. Addressing the Standing Committee on Science and Technology on Wednesday, Iyengar said the liability legislation should not be considered approval for joining the CSC. The committee is expediting work on the bill with the aim of submitting its report to the Rajya Sabha (the legislature's upper house) during the monsoon session that begins Jul. 26. Media reports suggest the committee is likely to recommend substantially increasing the existing Rs 500 crore (US\$110 million) compensation cap — the low level was part of the reason the bill was sent to the panel after encountering stiff legislative opposition in May (UIW May10,p4). Supplier liability also has to be "pinned down," according to the *Deccan Herald*, which also reported that the bill is unlikely to cover any future private nuclear operator. "Such an eventuality could be covered under a separate legislation," a committee member told the newspaper.

## KAZAKHSTAN

Japan's Nuclear Fuel Industries (NFI) has certified UO2 powder produced at Kazatomprom's Ulba Metallurgical Plant (UMP), which will "allow UMP to launch a project on uranium dioxide power supply to the Japanese market," the Kazakh state-owned uranium producer announced Jul. 14. The two companies also signed a document "specifying terms for agreements on production of uranium dioxide powder intended for the Japanese nuclear fuel market," according to the statement. However, the first shipments can't be delivered until the Japan-Kazakhstan nuclear cooperation agreement, signed in March, is ratified. Kazatomprom has made selling more of the UMP's uranium powders and pellets a priority (UIW Jun.7,p4).

## NIGER

Australia's Paladin Energy is pushing into Niger with an A\$27 million (US\$23.8 million) deal announced last week to acquire junior explorer NGM Resources Limited. NGM's most advanced project is currently the Takardeit project in the Tim Merso Basin, some 100 km south of Areva's massive Imouraren deposit. NGM announced in January inferred resources of some 11 million lbs U3O8 at Takardeit. The Paladin bid, which would increase the larger company's stake in NGM from 22.5% to 100%, was unanimously recommended by NGM's directors to its shareholders, who would receive one ordinary Paladin share for every 23.9 ordinary NGM shares — representing a premium of 54% to the average NGM share price in the five days prior to the announcement. If the NGM shareholders approve the deal, as appears likely,

it will represent a major new focus for Paladin, which has largely focused on Namibia, Malawi and Australia since its creation. Niger's uranium production has long been dominated by Areva, but this year will see the commissioning of China's Azelik operation (UIW Mar.8,p4).

## UNITED KINGDOM

The recent government decision to cancel a loan to Sheffield Forgemasters turned toxic for the coalition government of Prime Minister David Cameron and his deputy, Nick Clegg, after e-mails from a Tory donor lobbying for the cancellation emerged last week. In June the government, citing budget pressures, axed the loan, which would have enabled the forger to build a new 15,000 metric ton press for building ultra-heavy nuclear forgings (UIW Jun.21,p6). "I am the largest donor to the Conservative Party in Yorkshire and have been since David Cameron was elected leader," opened a May 25 e-mail from industrialist Andrew Cook, who owns two steel casting plants in Sheffield, to the coalition's business minister, Mark Prisk. While stressing that "Sheffield Forgemasters is not a competitor of my business," Cook wrote in the email, obtained by UIW, "I have specialist knowledge of the situation" and the loan "is probably unnecessary and possibly illegal under EU rules." When the e-mails were revealed last week, opposition Labour MPs immediately attacked the coalition government, and speculated that it may have helped Cook's reputed maneuverings to take over Forgemasters. Responding to the charges, Clegg said the accusers "won't live up to their own responsibility in making a number of promises with money they didn't have."

## UNITED STATES

Spending in the US uranium production industry fell 40% to \$281 million from 2008 to 2009 as the spot price settled lower and the third wave of uranium exploration wound down, according to the US Energy Information Administration (EIA). The steepest spending drop was on land (down 73%), followed by exploration and drilling (down 55%), and production spending (down 36%). This seems to support Cameco Vice President for Exploration Colin Macdonald's presentation at the World Nuclear Fuel Markets conference in San Diego last month. He said there have been three major waves of uranium exploration that tracked a changing spot price, from 1945 to 1955, 1975 to 1985, and 2005 to the present, which is now tapering off. Overall, US production was 4.1 million lbs U3O8 in 2009, up 7% from 2008, according to the EIA. Of that, 3.7 million lbs U3O8 was processed into yellowcake (down 5%), and 3.6 million lbs U3O8 was shipped out (down 12%).

## UNITED STATES

The House and Senate versions of the fiscal year 2011 Energy and Water Appropriations bill include more than \$11 million in earmarks for projects in legislators' home states (see story). The House list doesn't offer dollar figures, but shows Massachusetts Democrats Bill Delahunt, Stephen Lynch and Niki Tsongas set aside funds for a "nuclear power operator simulator." According to the Senate list: Sen. John Kerry, Democrat from Massachusetts, also set aside \$400,000 for a "nuclear power operator simulator"; Mississippi Republicans Thad Cochran and Roger Wicker flagged \$3.5 million for a project on the "characteristics and cleanup of the US nuclear legacy"; Utah Republicans Bob Bennett and Orrin Hatch added \$500,000 for a nuclear engineering research center; Republican Sen. George Voinovich and Democratic Sen. Sherrod Brown, both of Ohio, set aside \$2 million for a Nuclear Fabrication Consortium; Voinovich also set aside \$2 million for the Ohio State Nuclear Reactor Laboratory Facility expansion; and Sen. Harry Reid, Democrat of Nevada, put in \$2.5 million for oversight of the Yucca Mountain shutdown. (The DOE's Office of the Inspector General issued a report last week decrying the department's failure to properly plan for the shutdown, due for completion in September.) ☼



# ENERGY INTELLIGENCE URANIUM MARKET UPDATE

For the week ended July 23, 2010

Previously known as the Nukem Weekly Report and the Nukem Price Bulletin

## Monthly Spot Market Prices

	Change	2010								2009
		Jun.	May	Apr.	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.
Uranium										
Low (\$/lb U3O8)	-	+40.50	+40.50	+40.50	+40.50	+41.25	+42.00	+42.00	+42.00	+42.00
High	-	+41.75	+41.75	+41.75	+42.00	+42.25	+45.50	+45.00	+47.00	+47.00

## June Spot Conversion (\$/kg U)

Low	6.00
High	7.50

## June Spot SWU (\$/SWU)

Low	153.00
High	158.00

## Spot Bids and Offers

Buyer or Seller	Category	Due by	Uranium Qty. ('000 lbs U3O8)	Conversion Qty. ('000 Kgs U)	SWU Qty. ('000 SWU)	Form	Delivery	Origin
Buyer:	US Utility			40		UF6		Unknown

## No Term Bids or Offers

## Term Evaluations

Buyer or Seller	Category	Due by	Uranium Qty. ('000 lbs U3O8)	Conversion Qty. ('000 Kgs U)	SWU Qty. ('000 SWU)	Form	Delivery	Origin
Buyer:	Non-US Utility	5/12/2010	250			U308	2012-2018	Unknown
Buyer:	US Utility	7/23/2010			100	Enrichment	Q4 2012-Q2 2013	US Legal
Buyer:	US Utility	7/22/2010	250			U308 or UF6	2010-2012	Unknown
Buyer:	US Utility	7/22/2010	1,100			U308 or UF6	2015-Unknown	Unknown

## Spot Evaluations

Buyer or Seller	Category	Due by	Uranium Qty. ('000 lbs U3O8)	Conversion Qty. ('000 Kgs U)	SWU Qty. ('000 SWU)	Form	Delivery	Origin
Buyer:	Non-US Utility	7/20/2010	300			U308	12/21/2010	Unknown

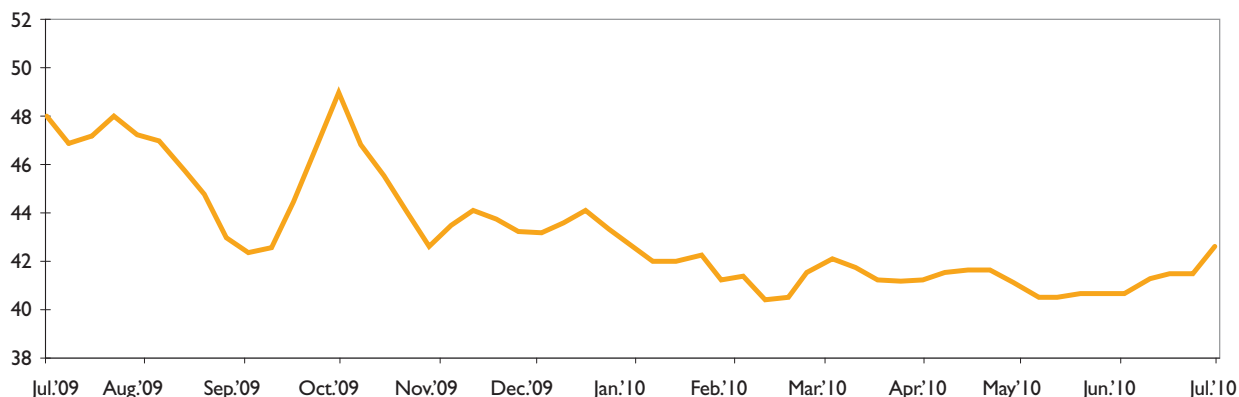
## Spot Transactions

Buyer or Seller	Category	Due by	Uranium Qty. ('000 lbs U3O8)	Conversion Qty. ('000 Kgs U)	SWU Qty. ('000 SWU)	Form	Delivery	Origin
Buyer:	Non-US Producer		300			U308		Unknown

## No Term Transactions

(\$/lb U3O8)

## Uranium Price Panel Over the Previous Year



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