Insight: The waiting game

There is a saying that good things come to those that wait. The long-term fundamentals of the uranium industry remain strong on the demand side but the medium-term outlook remains in neutral, waiting for a kick start.

The near term signals are not yet strong enough to push the uranium price to a level that will stimulate new projects. Critically, until utilities reenter the market in significant volumes then any spot movements up or down are too early to signify a sustainable long-term trend.

Strategically nuclear remains a key part of global energy mix as evidenced by a recent UK-China civil nuclear deal. China’s new build is real. However, offsetting pressure continues from growth in shale, tempered by reduced oil & gas prices, as the geopolitical balance of power plays out in the oil industry. There are a number of scenarios that could evolve but it serves as a reminder of the volatility and political nature of oil and gas.

URANIUM

The long-term fundamentals of the uranium industry remain strong on the demand side but the medium-term outlook remains in neutral, waiting for a kick start.

Derek Meates
KPMG in Canada

The waiting game will likely continue for the medium-term but price momentum could snowball in a short space of time with a coalescence of factors such as supply disruption, Japanese restarts or a worsening geopolitical position.

Uranium price trends

Term prices for uranium continued their decline through 2014, falling about 1 percent from US$44.8/lb in Q2, 2014 to US$44.3/lb in Q3, 2014. This can be attributed mainly to additional supply in the market and delay in restarting of Japan’s nuclear capacity. In addition, spot uranium prices declined about 17 percent from US$35.0/lb in Q1, 2014 to US$29.0/lb in Q2, 2014, though they reversed the trend to increase about 10 percent to US$31.8/lb in Q3, 2014. The increase in the spot market was likely driven by normal trading activity and concerns around the impact of Russian sanctions. It must be remembered that the spot market for uranium is not a liquid market with annual volumes of approx. 30Mlbs versus an historical uranium market of closer to 200Mlbs per annum the majority being driven by long-term contracts i.e. the term price.

Figure 1: Prices of uranium, Q3, 2002–2014


2 H.C. Wainwright and co. LLC – Uranium market update: Awakening and showing signs of life, 28 October 2014, via Thomson Research/Investext accessed October 2014
Longer-term prices are expected to increase driven by higher uranium consumption globally, especially from China, which is aggressively growing its nuclear power capacity. Prices will also be supported by the delivery of the last shipments which occurred in December 2013 from the US-Russian Highly Enriched Uranium (HEU) deal. Although uranium consumption is expected to grow quickly, brownfield expansions in regions such as Kazakhstan and ramp up at the nearly completed mines in Africa and Canada are expected to meet a major portion of this additional demand and moderate the uranium price increase in the medium-term.1

Figure 2: Market balance vs. prices, 2013–2018E*

*Market balance presents the difference between the world primary uranium production and the world uranium consumption.


Supply and demand4,5,6

Supply

Figure 3: World uranium production, 2013–2018E

Source: BMO Capital Markets – Global commodities research – Commodities canvas – Q2/14: Seasonal challenges and opportunities (Report), 16 April 2014; via Thomson research/ Investext, accessed November 2014; KPMG analysis

- Global uranium supply is expected to decline about 7.2 percent in 2014 and reach about 188.5Mlbs. During the year, most of the miners have continued to produce at 2013 or higher levels, although the prices were lower. Production was cut at Energy Resources of Australia Ltd (ERA)’s Ranger facility in Australia. This plant produced less during Q1, 2014 due to a waste spill in December 2013. Other mines to cut production were Paladin Energy’s Kayalekera mine in Malawi which was put in care and maintenance and Cameco’s McArthur River mine in Canada where a labor dispute occurred. The secondary supplies have also been affected by about 15.7Mlbs (U3O8 equivalent), due to the end of the US-Russia Highly Enriched Uranium (HEU) program in December 2013.4
- Kazakhstan continued as the largest producer of primary uranium in 2013 producing about 36.4 percent of the global uranium produced in the year. It is expected that its share of production will decrease marginally to about 35.5 percent in 2014. Looking ahead, the production from the country is expected to grow at a CAGR of 0.6 percent from 56.3Mlb in 2013 to 579Mlb in 2018. This is expected to be primarily driven by the brownfield expansions at its low-cost in-situ mines. Other regions that are expected to witness growth are Africa and Canada where a number of projects in advanced stages are expected to support growth. These include the Cigar Lake mine in Canada with production capabilities of 18.0Mlbs per annum and the Husab mine in Namibia 15.0Mlbs, and further down the track possibly the Trekkopje mine in Namibia 6.6Mlbs and the Imouraren mine in Niger 11.0Mlbs.24
- In relation to supply its worth mentioning the Russian-Ukraine crisis and security concerns in Niger.

Russian/Ukraine crisis

Russia, the world’s sixth-largest producer of primary uranium and a major supplier of secondary uranium is deeply involved in the nuclear sector across a dozen European countries through the Russian Energy Strategy. Through this Russia promotes the export of Rosatom nuclear technology. Moreover, Russia enjoys significant political clout over Kazakhstan, the largest producer of Uranium globally. Thus, a decline in supply from Russia could affect the global uranium prices.

Recently, the US and EU added fresh sanctions against Russia in response to Russia’s ongoing conflict with the Ukraine. On 12 September 2014, US expanded sanctions against Russia and include OAO Sberbank, the country’s largest bank due to the fighting in eastern Ukraine. The EU included 15 companies such as Gazprom Neft and OAO Rosneft.8
Niger security
Niger has been facing security issues which have hampered the uranium production from the country. As per the World Nuclear Association (WNA), Niger is the world’s fourth ranking producer of uranium producing about 75 percent of the world mining output. However, the region has been seen some security issues which is affecting its uranium output. The major population of Niger is concentrated in the southwest region. The north of the country is a desert which is inhabited by militants. They have attacked uranium mines taking this region as the base of their operations.

Demand

Figure 4: World uranium consumption, 2013–2018E

Source: BMO Capital Markets – Global commodities research – Commodities canvas – Q2/14: Seasonal challenges and opportunities (Report), 16 April 2014; via Thomson research/Investext, accessed November 2014; KPMG analysis

- Global uranium consumption is expected to increase about 4.8 percent y-o-y in 2014. This demand has come mainly from new reactors starting up in the non-OECD countries, especially China and India, and from reactors ramping up to full capacity. However, the 4.8 percent increase was much below expectations. This can be attributed to the partial demand offset by the closures of nuclear reactors in Japan post the Fukushima incident and the temporary shutdown of a number of reactors in South Korea. Europe is expected to continue as the largest consuming region in the world consuming about 61.7Mlbs in 2014. However, looking ahead the demand from Europe is expected to decline. This is driven by a number of reasons; including the French government’s plans to cap its nuclear capacity at about 63GW, its current production level; France aims to reduce the share of nuclear power in its energy mix from 75 percent to 50 percent by 2015. Germany and Belgium are planning to exit nuclear power over the next decade.

- The US is expected to continue as the second largest consumer of uranium in 2014 and consume about 28.5 percent of the global uranium consumed. Looking ahead, this scenario is expected to continue and the US will consume about 30.2 percent of the global uranium consumed in that year. The US is expected to lead the nuclear power generation in the medium-term despite the expected quick growth in the emerging economies and the shutdown of five nuclear reactors in the last 2 years. However, this is expected to be more than offset by the under-construction new reactors and increased output from the existing plants. Thus, uranium consumption in the US is expected to increase at a CAGR of about 1.6 percent to reach 56.7Mlbs in 2019 from 52.4Mlbs in 2013.

- China, which was the third-largest uranium consumer in 2013, is where the majority of growth is expected to come from within the next five years. Its nuclear power industry could more than triple its installed capacity by 2019 with 29 nuclear reactors currently under construction. Thus, the country’s uranium consumption is expected to increase at a CAGR of about 8.2 percent to 53.1Mlbs in 2019 from 35.8Mlbs in 2013. Another region diversifying its energy mix is the Middle East. The region intends to reduce its depletion of fossil fuels by decreasing its reliance on them and introducing nuclear power to its energy mix. The UAE has commenced the construction of two nuclear reactors and its first nuclear power plant is expected to have an eventual capacity of 5.6Gw. It is also implementing plans to develop its nuclear power industry. However, no reactors are expected to start before 2019.

- Japan is witnessing a huge energy imbalance post the Fukushima incident. Japan was heavily dependent on nuclear energy for its energy needs due to lack of domestic natural resources which could supply its energy. However, post the Fukushima incident of 2011, the country has placed on hold its use of nuclear energy making Japan import about 84 percent of its energy needs thus creating, in my view, an unsustainable trade imbalance.

The number of proposed nuclear reactors declined to 301 as of October 2014, compared to 309 in April 2014. However, the number of planned reactors increased to 174 from 173 in April 2014, whereas the number of under-construction nuclear reactors decreased from 72 to 71.

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Ownership changes\textsuperscript{13}

There was limited transaction activity in Q2, 2014 and Q3, 2014. The total number of deals declined to two in Q3, 2014 from five in Q2, 2014, whereas the total value of deals decreased to US$24 million in Q3, 2014 from US$176 million in Q2, 2014.

Table 1: Uranium deals announced in Q2, 2014 and Q3, 2014

\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
Date & Target & Acquirer & Status & Value of transaction (US$ million) & Stake (%) \\
\hline
11/09/2014 & Azarga Resources Limited & Powerlite Ventures Ltd. & Completed & 19.0 & 43 \\
15/08/2014 & Uranium One Inc & Anfield Resources Inc. & Announced & 5.0 & N/A \\
09/06/2014 & Talen Energy Corporation & PPL Corporation & Announced & N/A & 65 \\
\hline
\end{tabular}

\textsuperscript{13} Mergermarket accessed October 2014
<table>
<thead>
<tr>
<th>Date announced</th>
<th>Target</th>
<th>Acquirer</th>
<th>Status</th>
<th>Value of transaction (US$ million)</th>
<th>Stake (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18/05/2014</td>
<td>Semizbay-U</td>
<td>CGN Mining Co. Ltd.</td>
<td>Announced</td>
<td>133</td>
<td>49</td>
</tr>
<tr>
<td>09/05/2014</td>
<td>European Uranium Resources Ltd.</td>
<td>Forte Energy NL</td>
<td>Announced</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>05/05/2014</td>
<td>Energy and Minerals Australia Limited</td>
<td>Macquarie Bank Limited; Acorn Capital Limited; Element Resources Fund</td>
<td>Completed</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>14/04/2014</td>
<td>International Enexco Limited</td>
<td>Denison Mines Corp.</td>
<td>Announced</td>
<td>14</td>
<td>92</td>
</tr>
</tbody>
</table>

**Regulatory updates**

During Q4, 2013 and Q1, 2014, the regulations were targeted at making uranium operations safer and keeping in consideration the interests of the local communities.

**Table 2: Recent regulations in the uranium industry**

<table>
<thead>
<tr>
<th>Country</th>
<th>Regulation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Wyoming considers regulating uranium industry&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Wyoming, the largest uranium-producing state in the US is expected to take over the regulation of uranium mining in the state from the Federal Nuclear Regulatory Commission.</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Consent from local communities&lt;sup&gt;15&lt;/sup&gt;</td>
<td>As per a new amendment by the Slovakian government, uranium mining companies in the country would be able to proceed under the Mining Act with its application for mining authorization only on consent from local communities.</td>
</tr>
<tr>
<td>Canada</td>
<td>Consultation fees&lt;sup&gt;16&lt;/sup&gt;</td>
<td>The Quebec government in Canada initiated a consultation fee over a proposed uranium mine by Strateco Resources Inc., the only uranium producer in Quebec province in the country.</td>
</tr>
</tbody>
</table>

**Recent agreements in the uranium industry**

UK and China have signed a civil nuclear deal which is expected to pave the way for Chinese investment into UK. As per the deal, Chinese companies could own and operate a China designed nuclear power station in the UK.

**Table 3: Recent agreements in the uranium industry**

<table>
<thead>
<tr>
<th>Country</th>
<th>Regulation</th>
<th>Description</th>
</tr>
</thead>
</table>
| India and Australia | Civilian nuclear agreement<sup>17</sup> | • India and Australia signed a civil nuclear agreement on 05 Sep 2014  
• Australia had previously lifted the ban to sell uranium to India in 2012. |
| Vietnam Agency for Radiation and Nuclear Safety (VARANS) and Lightbridge Corporation | Cooperation to support nuclear safety<sup>18</sup> | • VARANS and Virginia, US based Lightbridge Corporation have signed a memorandum of understanding (MOU) on 14 August 2014  
• The MOU aims for cooperation in development of administrative, legal and regulatory infrastructure to support Vietnam’s civil nuclear energy program. |
| UK and China  | Civil nuclear agreement<sup>19</sup> | • China and UK have signed a civil nuclear co-operation agreement in June 2014. It paved the way for another deal as per which Chinese companies could own and operate a China designed nuclear power station in the UK.  
• As per the Department of Energy and Climate Change (DECC), the deal would make the two nations cooperate on various aspects of the nuclear fuel supply chain cycle. |

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<sup>14</sup> Wyoming considers regulating uranium industry; 10 October 2014, via Factiva, accessed October 2014
<sup>15</sup> *Uranium mining in Slovakia to proceed only on consent from locals*; 6 June 2014, via Factiva, accessed October 2014
<sup>16</sup> *Drawn-out permitting process ‘end of the road’ for Strateco, Quebec’s only uranium explorer*; 26 May 2014, via Factiva, accessed October 2014
<sup>17</sup> *India signs civil nuclear agreement with Australia (Australia had lifted the ban on India in 2012)*; 6 September 2014, via Factiva, accessed November 2014
<sup>18</sup> *“VN, US sign cooperation agreements to support nuclear safety program”*; 27 August 2014, via Factiva, accessed November 2014
<sup>19</sup> James Murray *“UK and China ink ‘landmark’ civil nuclear agreement”*; Business green, 16 June 2014, accessed November 2014
### Cross-section of global uranium projects

#### Table 4: Cross-section of global uranium projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Country/Region</th>
<th>Operators</th>
<th>Capex (US$ million)</th>
<th>Initial production</th>
<th>Annual Uranium capacity (Mlbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akbastau uranium mine</td>
<td>South Kazakhstan province, Kazakhstan</td>
<td>Akbastau JV JSC</td>
<td>608.5</td>
<td>2009</td>
<td>5.0</td>
</tr>
<tr>
<td>Cigar Lake uranium project</td>
<td>Saskatchewan, Canada</td>
<td>Cameco Corporation</td>
<td>2,600.0</td>
<td>2014</td>
<td>18.0(^2)</td>
</tr>
<tr>
<td>Etango uranium deposit</td>
<td>Namib desert sands, Namibia</td>
<td>Bannerman Resources Limited</td>
<td>870.0(^1)</td>
<td>N/A</td>
<td>6.0 – 9.0</td>
</tr>
<tr>
<td>Haggan uranium/ Molybdenum/ Vanadium project</td>
<td>Jamtland, Sweden</td>
<td>Aura Energy Limited</td>
<td>537.0(^2)</td>
<td>N/A</td>
<td>7.8</td>
</tr>
<tr>
<td>Husab uranium deposit</td>
<td>Swakopmund, Namibia</td>
<td>Swakop Uranium (Pty) Ltd</td>
<td>1,480.0</td>
<td>2015</td>
<td>15(^2)</td>
</tr>
<tr>
<td>Imouraren uranium mine</td>
<td>Arlit, Niger</td>
<td>Areva NC</td>
<td>N/A</td>
<td>Indefinitely postponed</td>
<td>11.0</td>
</tr>
<tr>
<td>Inkai uranium mine</td>
<td>Ongtustik, Kazakhstan</td>
<td>Joint Venture Inkai Limited Liability Partnership</td>
<td>359.2(^4)</td>
<td>2009</td>
<td>5.2</td>
</tr>
<tr>
<td>Karatau uranium mine</td>
<td>Ongtustik, Kazakhstan</td>
<td>Uranium one Inc.</td>
<td>N/A</td>
<td>2009</td>
<td>5.2</td>
</tr>
<tr>
<td>Kayelekera uranium mine</td>
<td>Karonga, Malawi</td>
<td>Paladin Energy Ltd.</td>
<td>182.0</td>
<td>2009</td>
<td>3.3 (The mine has been put on care/maintenance)</td>
</tr>
<tr>
<td>Kharasan uranium mine</td>
<td>Oqzylorda, Kazakhstan</td>
<td>Uranium one Inc.</td>
<td>N/A</td>
<td>2009</td>
<td>7.8</td>
</tr>
<tr>
<td>Kintyre uranium deposit</td>
<td>Western Australia, Australia</td>
<td>Cameco Corporation</td>
<td>600</td>
<td>N/A</td>
<td>6.0</td>
</tr>
<tr>
<td>Madaouela uranium project</td>
<td>Agadez, Niger</td>
<td>Goviex Uranium Inc.</td>
<td>646.0</td>
<td>N/A</td>
<td>2.5</td>
</tr>
<tr>
<td>McArthur River mine</td>
<td>Saskatchewan, Canada</td>
<td>Cameco Corporation</td>
<td>3,500.0</td>
<td>1999</td>
<td>21.0</td>
</tr>
<tr>
<td>Olympic Dam Copper/ uranium mine</td>
<td>South Australia, Australia</td>
<td>BHP Billiton Ltd</td>
<td>N/A</td>
<td>1988</td>
<td>8.8</td>
</tr>
<tr>
<td>Rabbit Lake uranium mine</td>
<td>Saskatchewan, Canada</td>
<td>Cameco Corporation</td>
<td>N/A</td>
<td>1975 (Production ends in 2018)</td>
<td>4.0</td>
</tr>
<tr>
<td>Ranger uranium mine</td>
<td>Northern Territory, Australia</td>
<td>Energy Resources of Australia Ltd</td>
<td>N/A</td>
<td>1980</td>
<td>11.1</td>
</tr>
<tr>
<td>Rossing uranium mine</td>
<td>Swakopmund, Namibia</td>
<td>Rio Tinto Ltd</td>
<td>N/A</td>
<td>1976</td>
<td>9.9</td>
</tr>
<tr>
<td>South inkai uranium mine</td>
<td>Ongtustik, Kazakhstan</td>
<td>Uranium one Inc.</td>
<td>N/A</td>
<td>2009</td>
<td>5.2</td>
</tr>
<tr>
<td>Wiluna uranium project</td>
<td>Western Australia, Australia</td>
<td>Toro Energy Ltd</td>
<td>269</td>
<td>2015</td>
<td>1.7</td>
</tr>
<tr>
<td>Yeelirrie uranium deposit</td>
<td>Western Australia, Australia</td>
<td>Cameco Corporation</td>
<td>650</td>
<td>N/A</td>
<td>7.7</td>
</tr>
</tbody>
</table>

The above table includes projects with capex exceeding US$500 million and the top ten uranium projects by 2013 annual production. The list is not exhaustive and contains only a limited number of projects.

\(^1\) Sources are hyperlinked to the project names

Source: Company data, BREE, Intierra

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\(^2\) Production from the McClean Lake mill which will process all of Cigar Lake’s mined uranium

\(^1\) Pre-production capital costs

\(^2\) Pre-production capital; annual sustaining capital of US$18 million per annum

\(^3\) Potential capacity

\(^4\) Remaining capital costs from 2010 to 2030
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Derek has extensive experience working with global listed entities and exploration companies in the mining sector in both Australia and Canada.