

Uranium (Q2, 2014 and Q3, 2014)

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.

“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

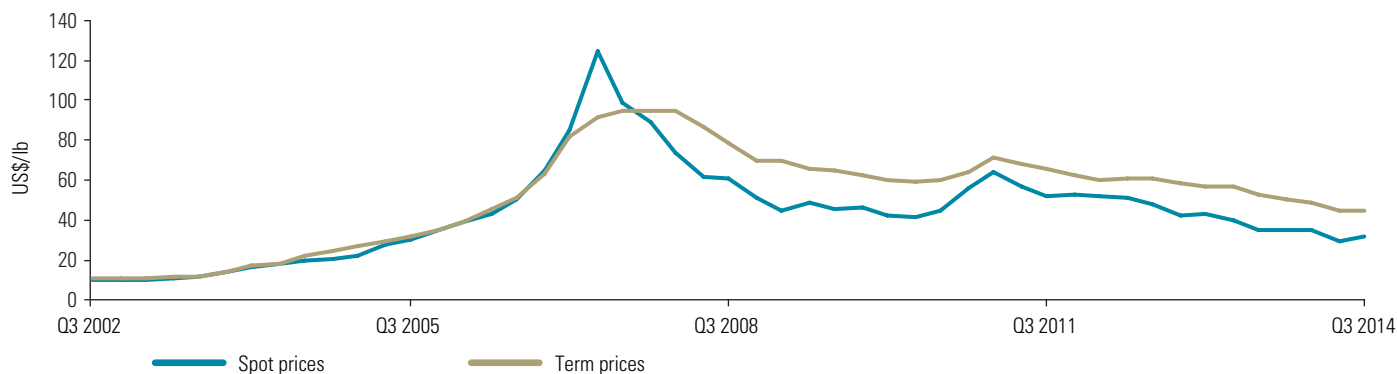
The waiting game will likely continue for the medium-term but price momentum could snowball in a short space of time with a coalescence of factors such as supply disruption, Japanese restarts or a worsening geopolitical position.

Uranium price trends^{1,2}

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.^{1,2}

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



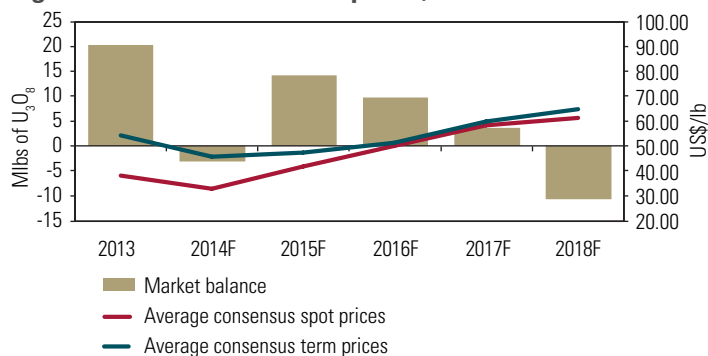
Source: Uranium price, Cameco, <http://www.cameco.com/invest/markets/uranium-price>, accessed 13 November 2014; “Resources and Energy Quarterly”; Bureau of Resources and Energy Economics, Australian Government, September quarter 2014 accessed 13 November 2014; KPMG analysis

¹ “Resources and Energy Quarterly”; Bureau of Resources and Energy Economics, Australian Government, September quarter 2014 accessed 13 November 2014; KPMG analysis

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.³ 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*



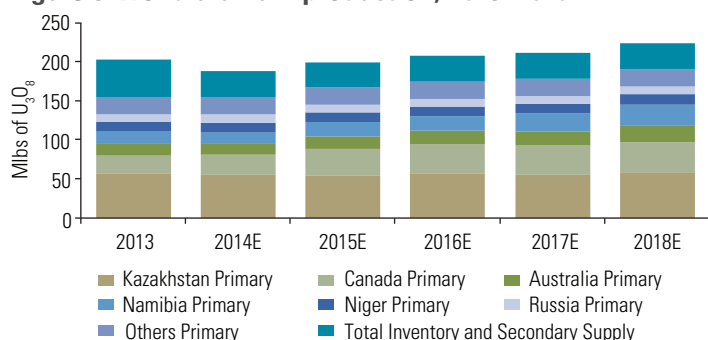
*Market balance presents the difference between the world primary uranium production and the world uranium consumption.

Source: "Resources and Energy Quarterly," Bureau of Resources and Energy Economics, Australian Government, September quarter 2014 accessed 13 November 2014; BB&T Capital Markets – Diversified mining weekly: CLF & FCX headline this week's earnings, 27 October 2014; BMO Capital Markets – Mining & commodity roundup, 3 November 2014; UBS Research – SA diversified miners "Q3 commodity price update: Major cut to," 17 October 2014; Numis Securities – Catching a falling knife, 8 October 2014; Credit Suisse – Australian iron ore sector – Looking for survivor bias; Benchmark, 5 November 2014; J.P. Morgan – Energy Resources of Australia Ltd, 28 July 2014; 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

Supply and demand^{4,5,6}

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 Kayelekera 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 57.9Mlb 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.^{7,8}
- 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

³ Megatons to Megawatts 2.0: Russia eyes new nuclear project with US energy industry," RT, 11 December 2013

⁴ "Resources and Energy Quarterly," Bureau of Resources and Energy Economics, Australian Government, September quarter 2014 accessed 13 November 2014; KPMG analysis

⁵ 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

⁶ 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

⁷ For sources, please refer to the projects table below

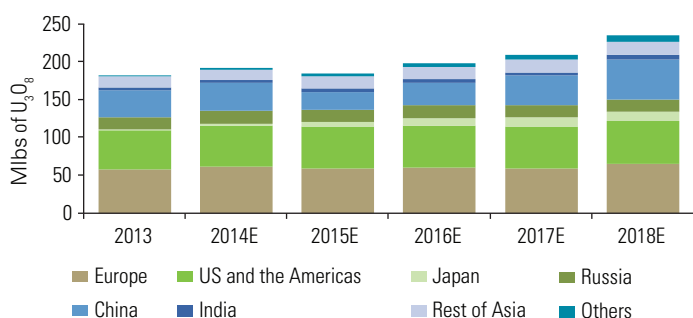
⁸ "Uranium games in Niger and the US-Franco competition," RT, 11 June 2014; Alex McAnneny "Niger: An Emerging Security Partnership," Center for Security Policy, 8 September 2014; "Uranium mine, military barracks attacked by suicide bombers in Niger," NBC News, 23 May 2013; Abdoulaye Massalaki "Areva and Niger in new uranium mining deal," The Africa Report, 26 May 2014; "Uranium in Niger," World Nuclear Association, updated September 2014

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 7.5 percent of the world mining output. However, the region has been seen some security issues which is affecting its uranium output.⁸ 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 63GWe, its current production level; France aims to reduce the share of nuclear power in its energy mix from 75 percent to 50 percent by 2015.⁹ Germany and Belgium are planning to exit nuclear power over the next decade.^{4,10}

- 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 2013.⁴
- 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 2019.⁴
- 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.¹¹

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 71.¹²

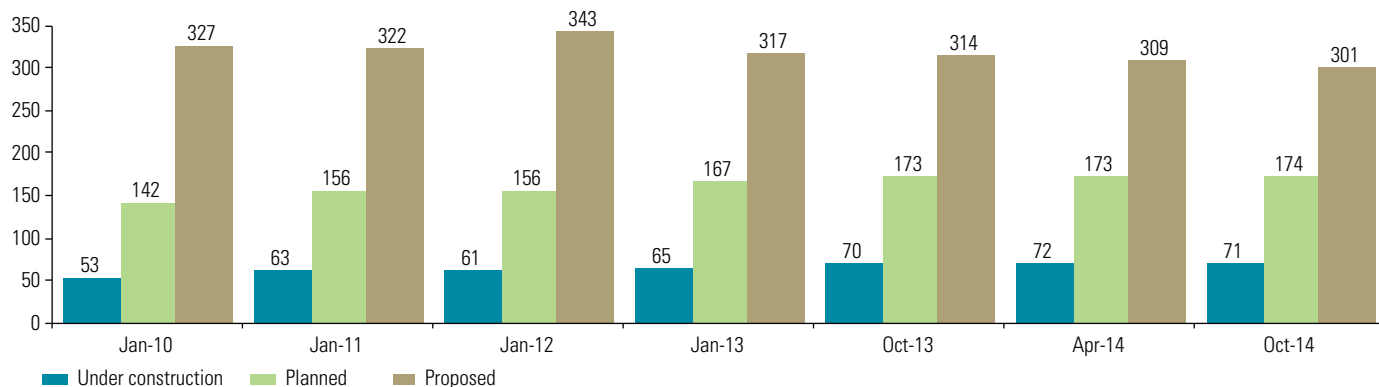
⁹ Geraldine Amiel "France to Dim Its Reliance on Nuclear Power," 18 June 2014, accessed November 2014

¹⁰ "Crunch time for the EU," World nuclear news, 12 August 2014, <http://www.world-nuclear-news.org/F-Crunch-time-for-the-EU-1208141.html>, accessed 14 November 2014

¹¹ "Nuclear Power in Japan," 25 November 2014, World Nuclear Association, accessed November 2014

¹² World Nuclear Power Reactors & Uranium Requirements, World Nuclear Association, <http://world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/>, accessed 13 November 2014

Figure 5: Number of nuclear reactors, January 2010–October 2014



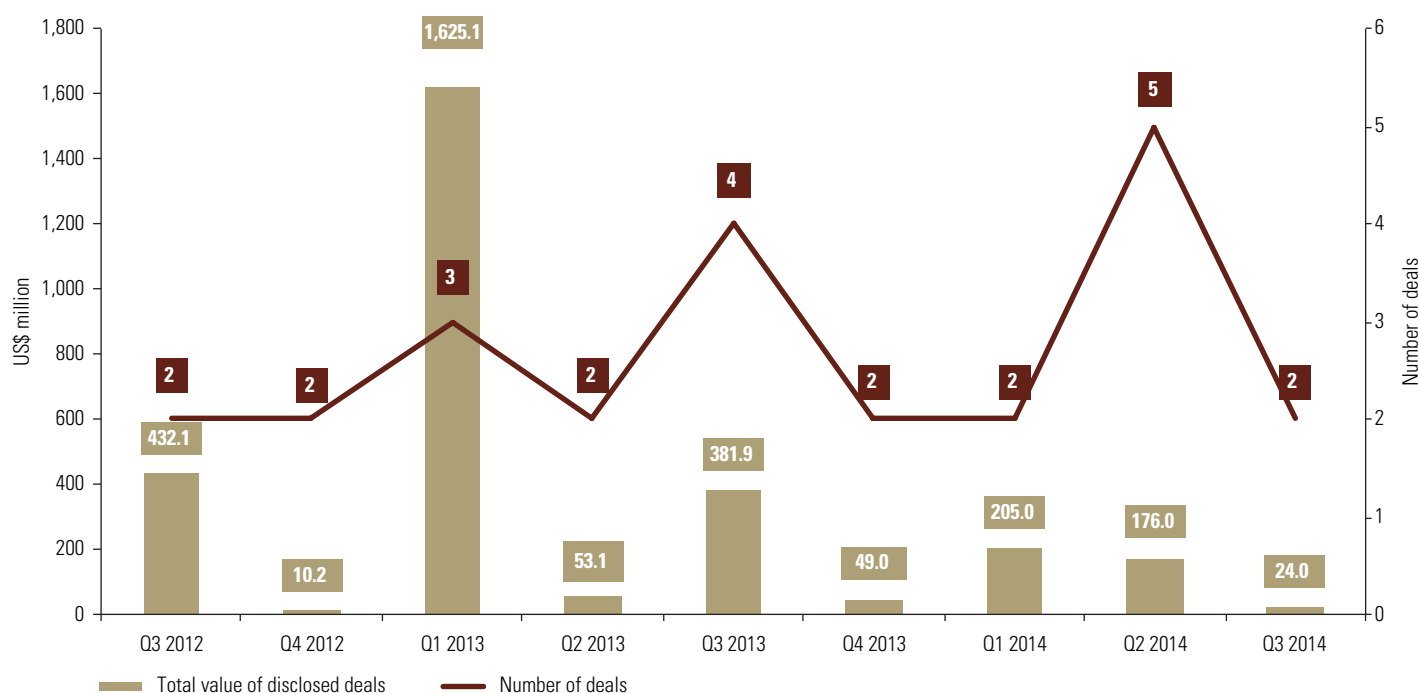
Source: World Nuclear Power Reactors & Uranium Requirements, World Nuclear Association, <http://www.world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/>, accessed 13 November 2014

Key developments

Ownership changes¹³

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.

Figure 6: Major deals in the uranium industry (Q3, 2012–2014)



Source: Mergermarket accessed October 2014; KPMG analysis

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

Date announced	Target	Acquirer	Status	Value of transaction (US\$ million)	Stake (%)
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

¹³ Mergermarket accessed October 2014

Date announced	Target	Acquirer	Status	Value of transaction (US\$ million)	Stake (%)
18/05/2014	Semizbay-U	CGN Mining Co. Ltd.	Announced	133	49
09/05/2014	European Uranium Resources Ltd.	Forte Energy NL	Announced	7	20
05/05/2014	Energy and Minerals Australia Limited	Macquarie Bank Limited; Acorn Capital Limited; Element Resources Fund	Completed	22	43
14/04/2014	International Enxco Limited	Denison Mines Corp.	Announced	14	92

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

Country	Regulation	Description
United States	Wyoming considers regulating uranium industry ¹⁴	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.
Slovakia	Consent from local communities ¹⁵	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.
Canada	Consultation fees ¹⁶	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.

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

Country	Regulation	Description
India and Australia	Civilian nuclear agreement ¹⁷	<ul style="list-style-type: none"> 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 ¹⁸	<ul style="list-style-type: none"> 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 ¹⁹	<ul style="list-style-type: none"> 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.

¹⁴ Wyoming considers regulating uranium industry, 10 October 2014, via Factiva, accessed October 2014

¹⁵ "Uranium mining in Slovakia to proceed only on consent from locals", 6 June 2014, via Factiva, accessed October 2014

¹⁶ "Drawn-out permitting process 'end of the road' for Strateco, Quebec's only uranium explorer", 26 May 2014, via Factiva, accessed October 2014

¹⁷ "India signs civil nuclear agreement with Australia (Australia had lifted the ban on India in 2012)", 6 September 2014, via Factiva, accessed November 2014

¹⁸ "VN, US sign cooperation agreements to support nuclear safety program", 27 August 2014, via Factiva, accessed November 2014

¹⁹ James Murray "UK and China ink 'landmark' civil nuclear agreement", Business green, 18 June 2014, accessed November 2014

Cross-section of global uranium projects

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

Project	Country/Region	Operators	Capex (US\$ million)	Initial production	Annual Uranium capacity (Mlbs)
Akbastau uranium mine	South Kazakhstan province, Kazakhstan	Akbastau JV JSC	608.5	2009	5.0
Cigar Lake uranium project	Saskatchewan, Canada	Cameco Corporation	2,600.0	2014	18.0 ²⁰
Etango uranium deposit	Namib desert sands, Namibia	Bannerman Resources Limited	870.0 ²¹	N/A	6.0–9.0
Haggan uranium/ Molybdenum/ Vanadium project	Jamtland, Sweden	Aura Energy Limited	537.0 ²²	N/A	7.8
Husab uranium deposit	Swakopmund, Namibia	Swakop Uranium (Pty) Ltd	1,480.0	2015	15 ²³
Imouraren uranium mine	Arlit, Niger	Areva NC	N/A	Indefinitely postponed	11.0
Inkai uranium mine	Ongtustik, Kazakhstan	Joint Venture Inkai Limited Liability Partnership	359.2 ²⁴	2009	5.2
Karatau uranium mine	Ongtustik, Kazakhstan	Uranium one Inc.	N/A	2009	5.2
Kayelekera uranium mine	Karonga, Malawi	Paladin Energy Ltd.	182.0	2009	3.3 (The mine has been put on care/maintenance)
Kharasan uranium mine	Qyzylorda, Kazakhstan	Uranium one Inc.	N/A	2009	7.8
Kintyre uranium deposit	Western Australia, Australia	Cameco Corporation	600	N/A	6.0
Madaouela uranium project	Agadez, Niger	Goviex Uranium Inc.	646.0	N/A	2.5
McArthur River mine	Saskatchewan, Canada	Cameco Corporation	3,500.0	1999	21.0
Olympic Dam Copper/ uranium mine	South Australia, Australia	BHP Billiton Ltd	N/A	1988	8.8
Rabbit Lake uranium mine	Saskatchewan, Canada	Cameco Corporation	N/A	1975 (Production ends in 2018)	4.0
Ranger uranium mine	Northern Territory, Australia	Energy Resources of Australia Ltd	N/A	1980	11.1
Rossing uranium mine	Swakopmund, Namibia	Rio Tinto Ltd	N/A	1976	9.9
South inkai uranium mine	Ongtustik, Kazakhstan	Uranium one Inc.	N/A	2009	5.2
Wiluna uranium project	Western Australia, Australia	Toro Energy Ltd	269	2015	1.7
Yeelirrie uranium deposit	Western Australia, Australia	Cameco Corporation	650	N/A	7.7

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.

[#] Sources are hyperlinked to the project names

Source: Company data, BREE, Intierra

²⁰ Production from the McClean Lake mill which will process all of Cigar Lake's mined uranium

²¹ Pre-production capital costs

²² Pre-production capital; annual sustaining capital of US\$18 million per annum

²³ Potential capacity

²⁴ 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.



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