

Industry Note

Equity Research

March 10, 2021

Metals & Minerals

Uranium Weekly: China's 14th Five-year Plan for Nuclear Power

The Ux Consulting (UxC) weekly spot price indicator slipped again this week to US \$27.30/lb (down \$0.45/lb). Since the start of the year, the spot price has dropped ~9%, and from its peak of US\$34/lb last May, the spot price is down ~20%. Uncovered utility demand is quite low for 2021 and 2022; uncovered demand for 2021 appears to be only several million pounds and utilities seem to be prepared to meet this demand on a discretionary basis, while continuing to manage inventories.

In our view, although anecdotal evidence suggests that utilities are increasingly turning to the term uranium market, they are not doing so in sufficient numbers or purchased volumes to put upward pressure on term pricing yet. We believe that the missing piece of the puzzle for a sustained upward move in the uranium term price remains the resumption of a term-contracting cycle.

Last Friday, the Chinese government announced details of its 14th Five-year Plan (2021-2025), including targets for installed nuclear-generating capacity by 2025. The target, 70 GWe of installed nuclear capacity, is a 37% increase over the ~51 GWe installed capacity at the end of 2020 (49 reactors). In addition to the installed capacity at the end of 2020, China had another 16 reactors under construction, with combined capacity of 16.5 GWe. To meet the 2025 target, the China would have to approve and build 3 GWe of capacity in addition to what is already under construction. Given the roughly five-year construction time frame for new build, timing could be tight to meet the 2025 target.

China's plans and targets for nuclear capacity levels have fluctuated over the years. The 13th Five-year Plan (2016-2020) had a target of achieving 58 GWe of nuclear capacity by 2020, with a further 30 GWe of capacity under construction. Both targets were missed, as noted above. Furthermore, the government planned to approve 6-8 reactors per year under the 13th Five-year Plan, increasing to 10 units per year after 2020. Before the Fukushima incident, China had aggressive plans for nuclear capacity levels, including 70-80 GWe by 2020, 200 GWe by 2030, and 400-500 GWe by 2050.

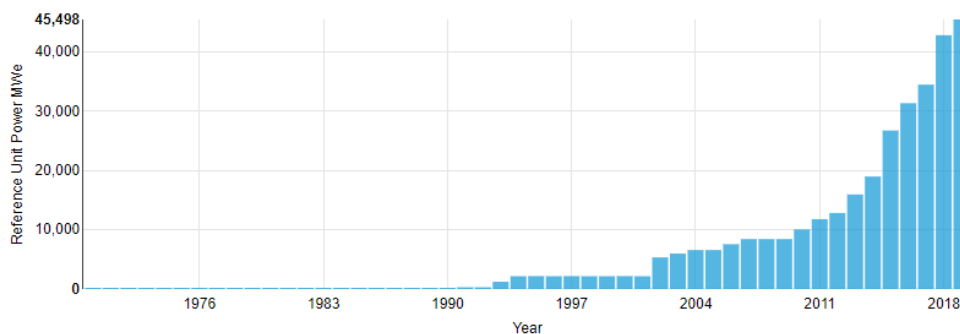
Last week, Reuters quoted CNNC President, Gu Jan, saying that the company is pushing the government for accelerated development of nuclear power and a white paper published by the company said that China needs to construct 6-8 new reactors per year to meet its goal of zero net emissions by 2060. By 2035, installed capacity should reach ~180 GWe. For reference, the U.S. currently has the world's largest installed capacity at ~96.5 GWe and 94 operable reactors.

Greg Barnes**Craig Hutchison, P. Eng****Derick Ma, CFA, CPA, CA****Joel Brown, P.Eng. (Associate)**

Exhibit 1. China & United States Installed/Operable Nuclear Power Capacity to YE 2019

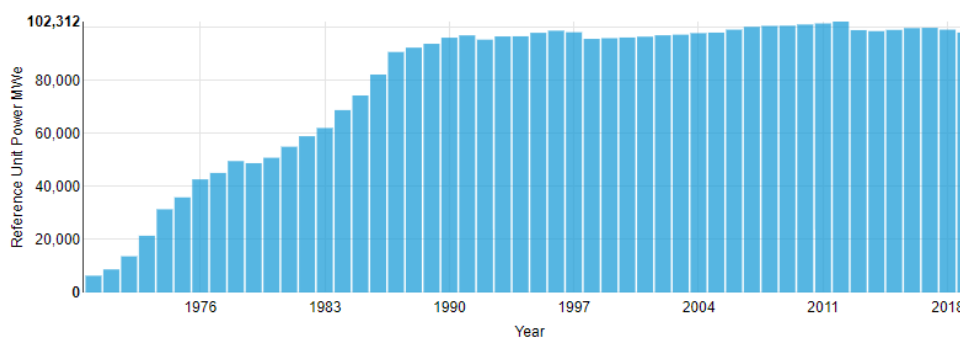
China Installed Capacity

Operable nuclear power capacity



United States Installed Capacity

Operable nuclear power capacity



Source: World Nuclear Association

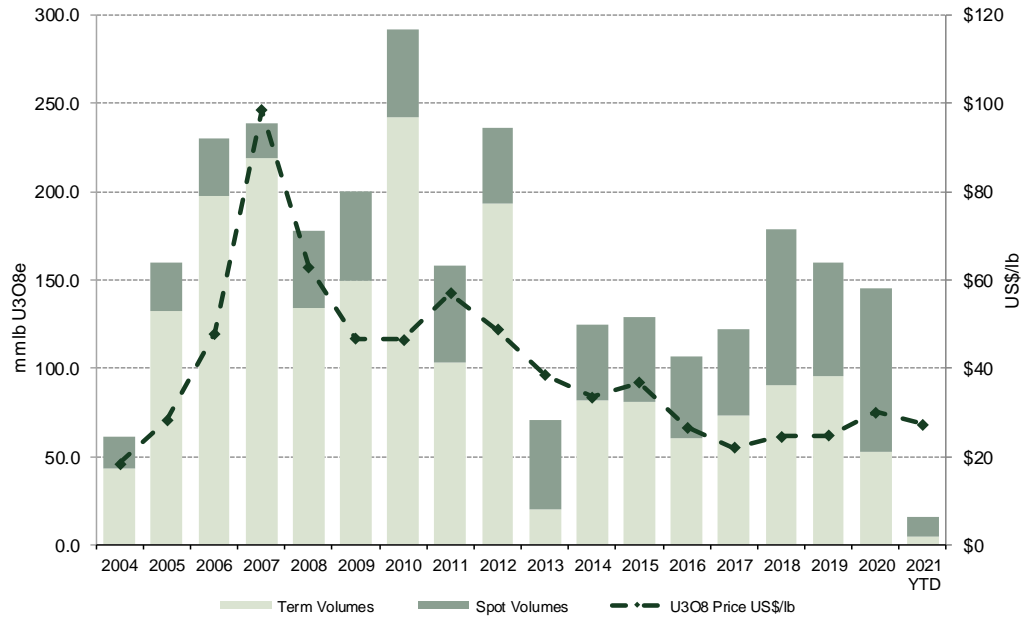


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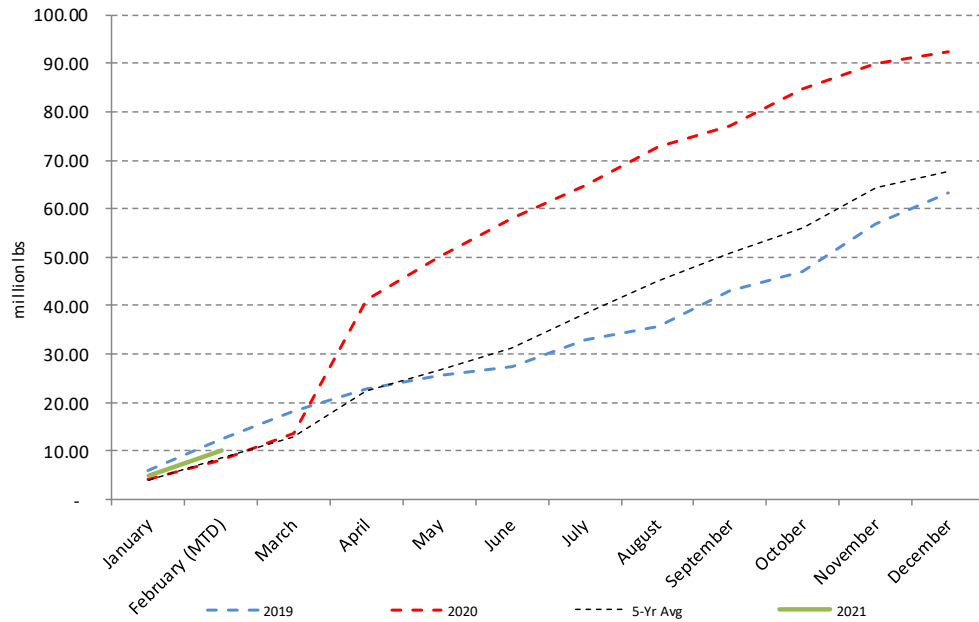
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Exhibit 2. Spot and Term Volumes



Source: UxC

Exhibit 3. Historical vs. 2021 Cumulative Monthly Spot Volumes



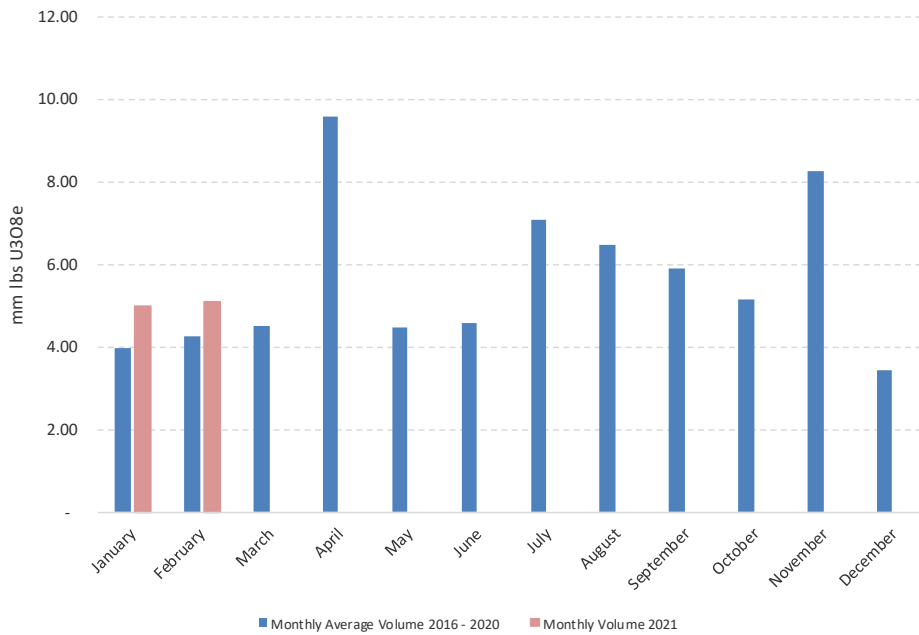
Source: UxC

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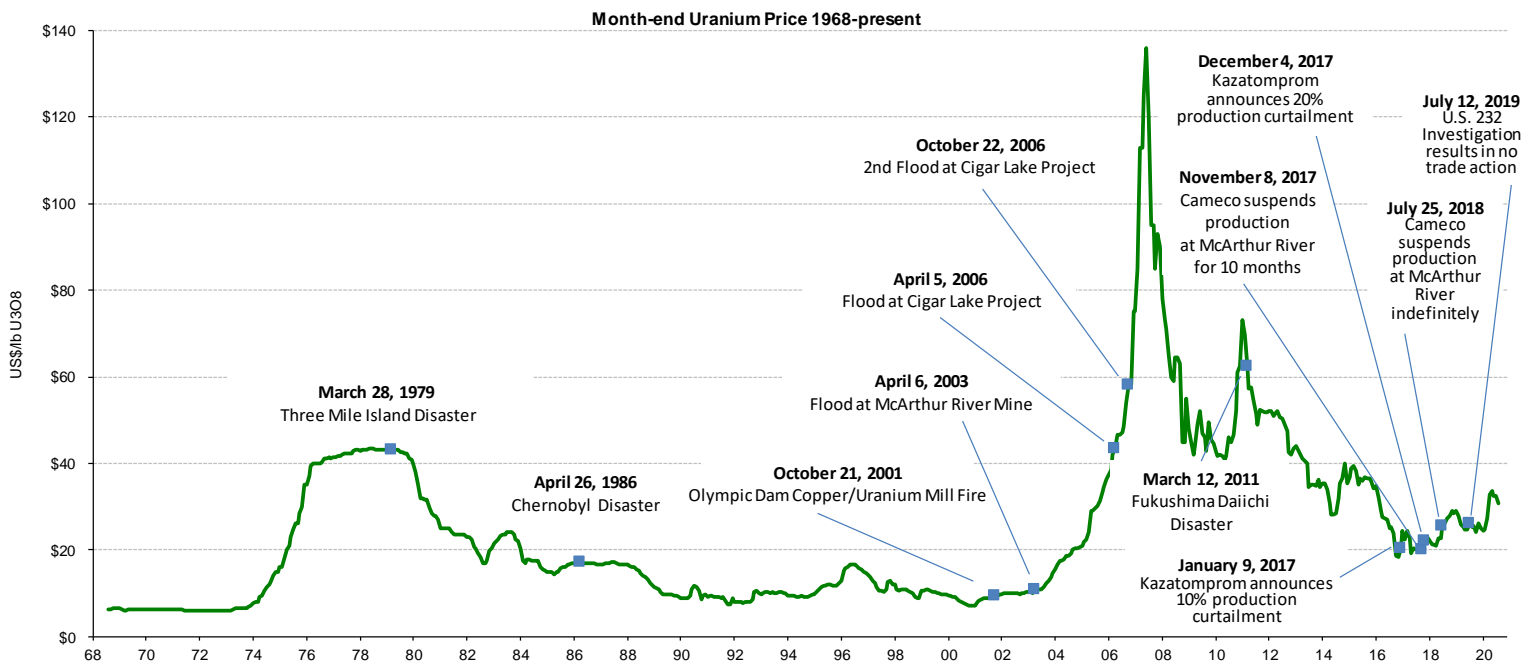
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Exhibit 4 Monthly Average Spot Volumes



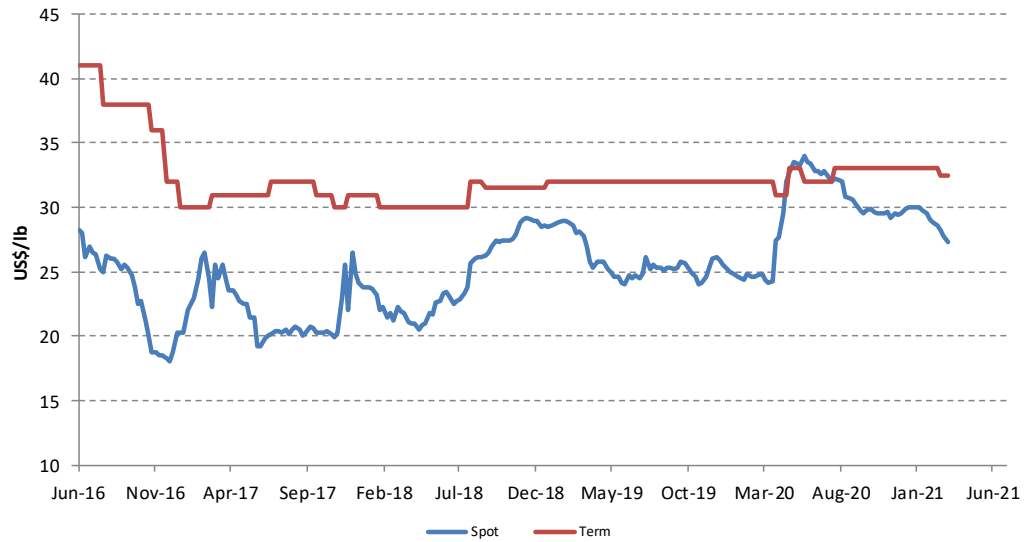
Source: UxC

Exhibit 5. Historical Spot Price and Market-affecting Events (US\$/lb)



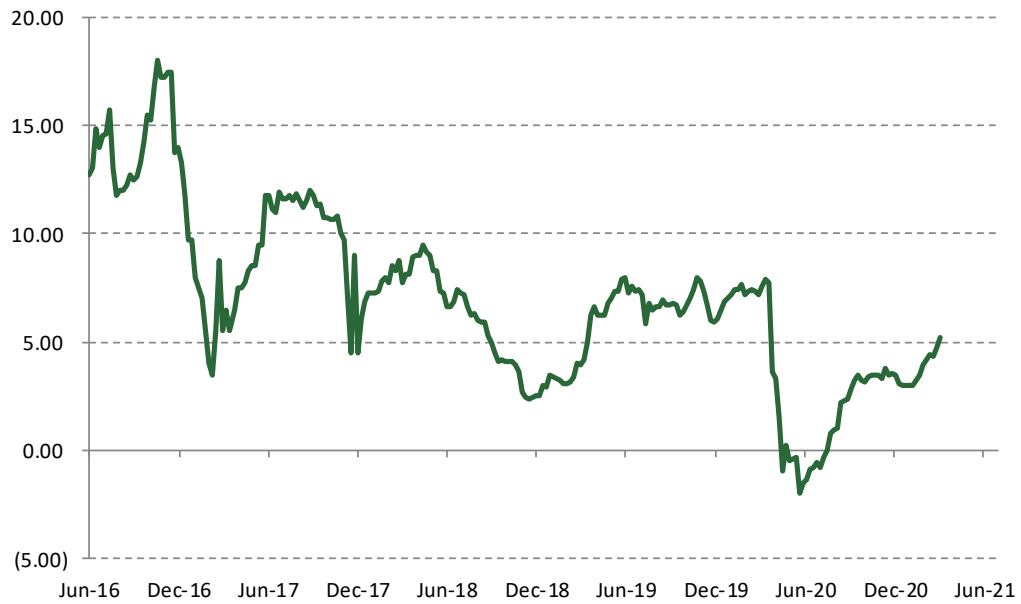
Source: UxC, companies, TD Securities Inc.

Exhibit 6. Spot and Term Uranium Prices (US\$/lb)



Source: UxC

Exhibit 7. Uranium Term Price Premium to Spot (US\$/lb)



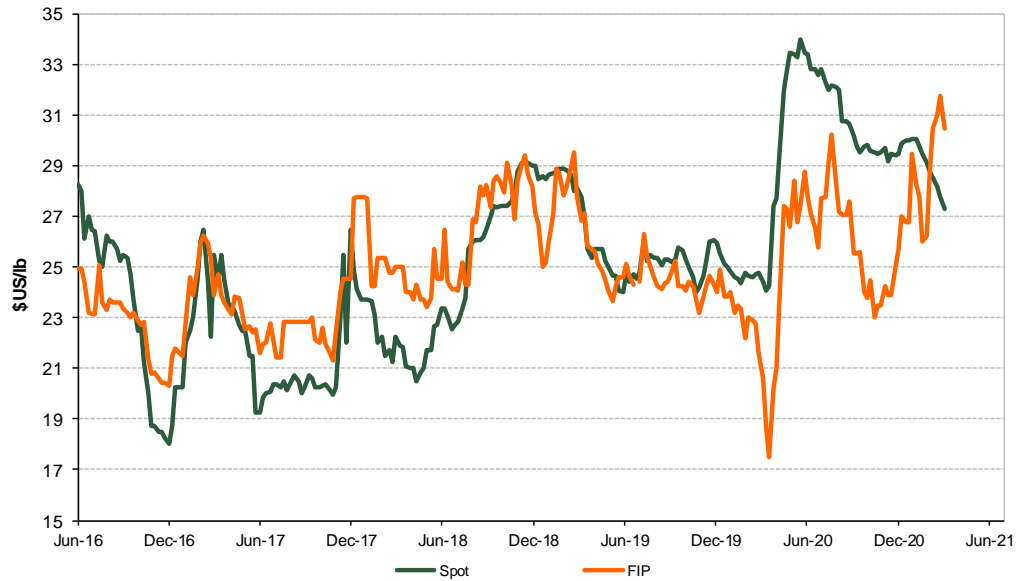
Source: UxC

Exhibit 8. Uranium Prices — Spot, 3-year Forward and 5-year Forward



Source: UxC

Exhibit 9. Fund Implied Price (FIP) and Spot Price



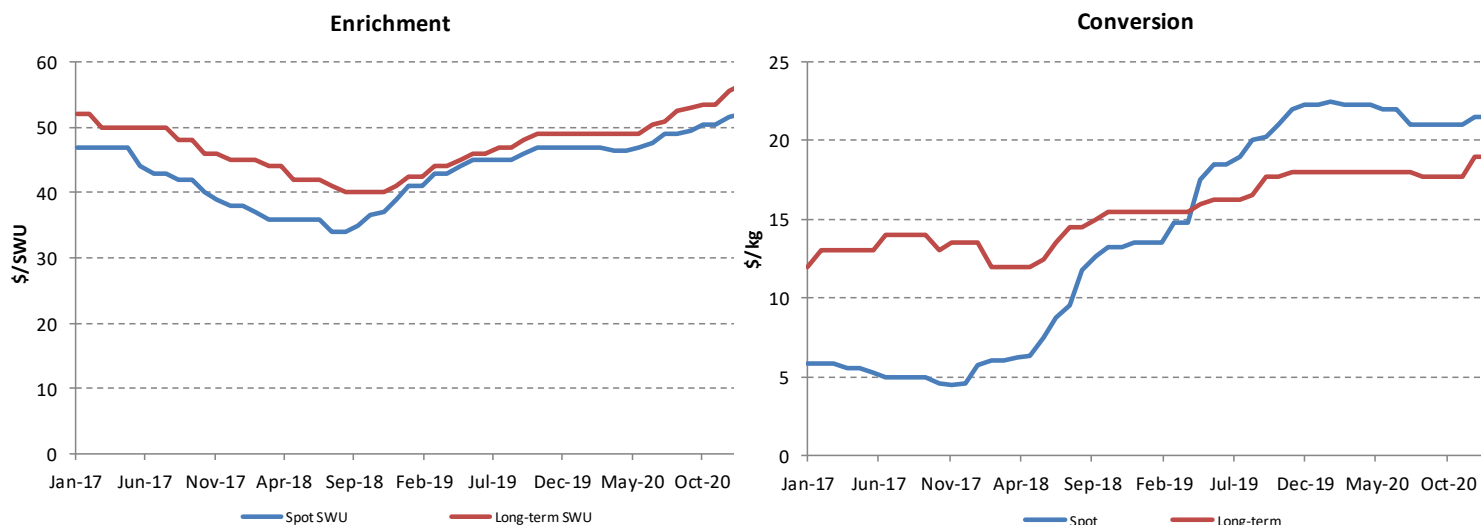
Source: UxC

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Exhibit 10. Monthly SWU and Conversion Pricing



Source: UxC

Exhibit 11. TD Securities Uranium Supply/Demand Model

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E
Mine Supply - Western World (Mlb U3O8)									
Total Mine Supply - Western World	100	83	85	75	76	80	85	88	86
Net Eastern Mine Supply (lbs U3O8)	54	54	55	44	52	53	60	66	72
Total World Mine Supply (Mlb U3O8)	154	138	140	119	128	133	145	154	158
YoY % change	-7.6%	-10.2%	1.7%	-15.2%	7.9%	3.3%	9.1%	6.8%	2.6%
Secondary Supply									
Global underfeeding and tails re-enrichment*	19	18	18	16	16	15	15	14	14
Mixed Oxide Fuel (MOX)*	5	5	6	6	6	6	6	7	8
US government sales (DOE Proposed)*	3	2	2	1	0	0	0	0	0
Additional Russian secondary supply*	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total Secondary Supply (Mlb)	27	24	26	24	22	21	21	21	21
Secondary supply as % of global reactor demand	16%	14%	15%	13%	12%	12%	12%	11%	11%
Mobilization of Commercial Inventory	7	7	7	7	7	7	7	7	7
Total Supply	187	169	173	150	157	161	173	183	187
Total World Demand									
Total World Nuclear Generating Capacity (MWe) *	358,819	368,571	372,978	374,420	384,508	385,211	389,242	394,906	398,885
Uranium requirements per MWe	472	472	472	472	472	472	472	472	472
Uranium demand (mmlb)	169	174	176	177	181	182	184	186	188
First Core Requirement (2 year lead)	-	-	-	-	-	-	-	-	-
Total World Demand (Mlb U3O8)	169	174	176	177	181	182	184	186	188
YoY % change	1.7%	2.7%	1.2%	0.4%	2.7%	0.2%	1.0%	1.5%	1.0%
Supply / Demand Balance (Mlb)	18	-5	-3	-27	-24	-21	-11	-4	-2
Spot Uranium Price (US\$/lb U3O8)	\$22.12	\$24.82	\$25.94	\$29.52	\$34.50	\$36.00	\$38.00	\$40.00	\$45.00

* Source: World Nuclear Association - Nuclear Fuel Report 2019-2040 Reference Case

Note - TD LT price assumption starts in 2025; a flat US\$45/lb price is assumed for 2025 and beyond.

Source: UxC, Bloomberg, World Nuclear Association, TD Securities Inc.

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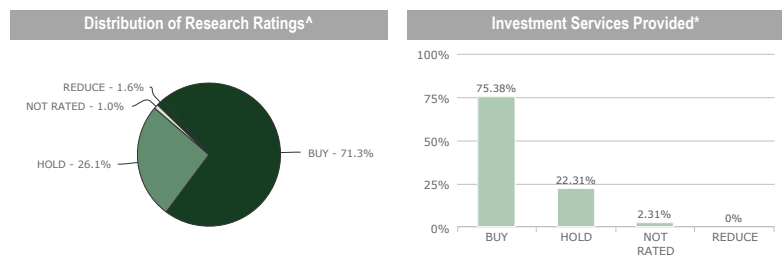
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