

Industry Note

Equity Research

September 14, 2022

Metals & Minerals

Uranium Weekly: Zaporizhzhya Last Reactor Shuts Down

The Ux Consulting (UxC) weekly spot price indicator published earlier this week increased to US\$52.00/lb, up US\$0.75/lb, or +1.5% over last week.

Safety and security concerns persist at the Zaporizhzhya Nuclear Power Plant (ZNPP). According to the International Atomic Energy Agency (IAEA), Russian shelling has damaged/destroyed power infrastructure in the city of Enerhodar causing blackouts. Enerhodar is home to some ZNPP workers and their families. Notably, all six reactors at ZNPP are now in a cold shutdown state (Unit 6 shut down September 11), however power (and staffing) is still required for reactor cooling and other safety systems. ZNPP was effectively cut off from the grid due to damaged transmission lines, until one of the lines was restored on September 10. Connection to the electrical grid provides ZNPP with power to maintain safety systems without having to rely on emergency diesel generators. According to the IAEA, ZNPP has 20 emergency diesels generators with supplies for at least 10 days. While ZNPP is in a cold shutdown, only power from one diesel generator per reactor is required to maintain safety. In our view, the situation at ZNPP continues to warrant investor attention as a potential nuclear accident/disaster at ZNPP could trigger a lasting chill over the global perceptions and demands on nuclear power over the foreseeable future. ZNPP was one of the topics discussed by German Chancellor Olaf Scholz and Russian President Vladimir Putin during a 90-minute phone call on Tuesday.

German Chancellor Olaf Scholz remains steadfast on 2022 reactor closure plans, keeping just two reactors in reserve till April 2023. There has been some heated debates with opposition politicians to reverse the nuclear phase-out policy given the Russian natural gas supply disruptions and soaring energy costs. However, Mr. Scholz has maintained that the nuclear plant phase out will continue as planned and noted that the country is moving quickly to cut its reliance on Russian gas imports. Mr. Scholz also added that German citizens must be willing to "rise above themselves" to deal with higher energy heating costs this winter "with boldness and bravery".

Before Russia's invasion of Ukraine, increasing price volatility, tightening supply in the spot market, and an increasing recognition that long-term supply is under threat were already contributing to nuclear utilities becoming more concerned about security of supply across the fuel supply chain. We expect uranium prices to see upward pressure over the medium term as utilities proceed with the difficult process of de-risking and repositioning their nuclear fuel supply chains away from Russian supply in what is already a tightly supplied market. In addition, we believe that Russia's actions have highlighted energy security, particularly in Europe (and in Japan), further bolstering the case for nuclear power.

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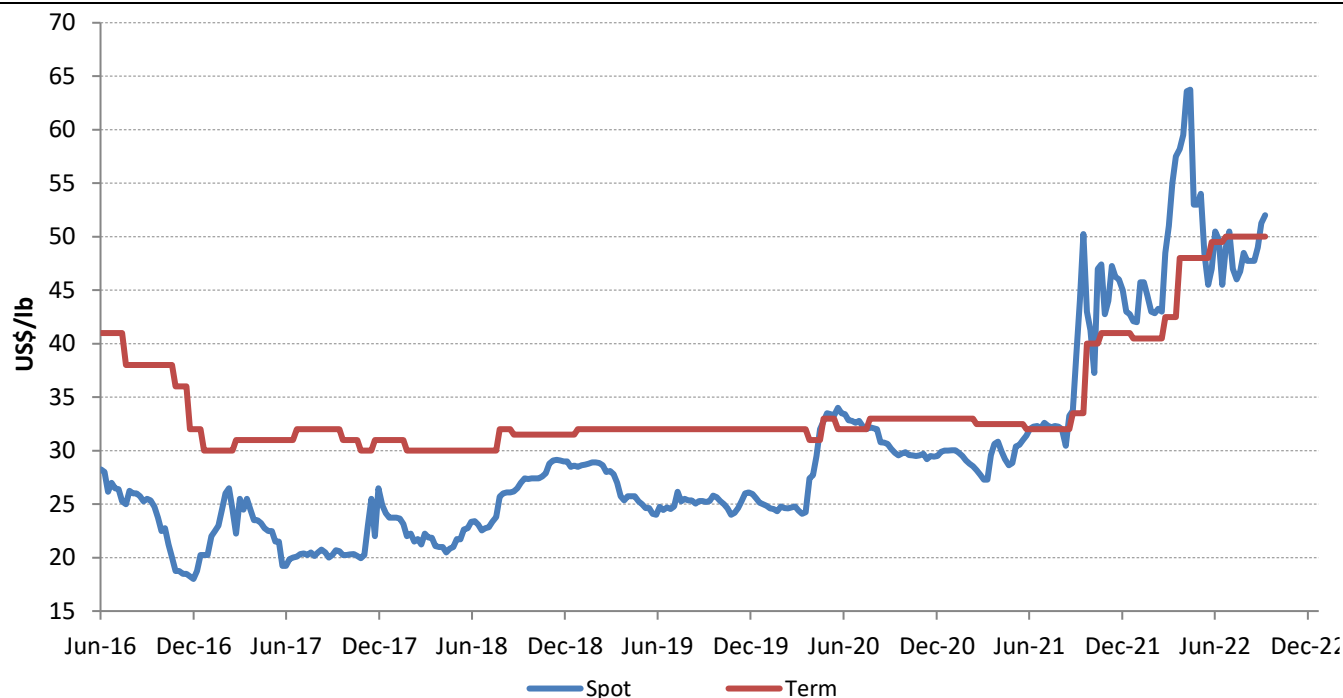
Exhibit 1. Uranium Comparable Table – EV/lb U₃O₈

Comparable Company Analysis: Uranium Producers & Developers/Explorers									
Company	Ticker	14-Sep-22 Share Price (C\$)	EV (US\$mm)	Corporate Resources ¹			EV/Res		
				2P (Mlbs)	M+I (Mlbs)	Global Resources (Mlbs)	EV/2P (US\$/lb)	EV/M&I (US\$/lb)	EV/All (US\$/lb)
Cameco Corp.	CCO	39.96	11,613.4	471.2	457.1	612.0	24.65	25.41	18.98
Denison Mines Corp.	DML	1.85	1,083.8	98.6	161.0	183.0	10.99	6.73	5.92
Fission Uranium Corp.	FCU	0.84	382.6	-	102.4	135.2	n/a	3.74	2.83
IsoEnergy Ltd.	ISO	4.38	365.0	-	48.6	51.3	n/a	7.51	7.12
Laramide Resources Ltd.	LAM	0.59	87.8	-	36.0	102.7	n/a	2.44	0.85
NexGen Energy Ltd.	NXE	5.87	2,041.6	234.1	256.7	337.4	8.72	7.95	6.05
Paladin Energy, Ltd.	PDN	0.79	1,654.0	62.9	96.1	176.7	26.32	17.22	9.36
Peninsula Energy Ltd.	PEN	0.17	118.7	-	15.8	53.6	n/a	7.51	2.21
Uranium Energy Corp.	UEC	5.37	1,346.9	-	226.6	295.7	n/a	5.95	4.55
Ur-Energy Corp.	URE	1.82	271.9	-	20.7	27.3	n/a	13.14	9.96
Median							17.82	7.51	5.99
Average							17.67	9.76	6.78

1: Resources are shown inclusive of reserves; M&I+I includes historical resource estimates.

Source: Company Reports; TD Securities; Capital IQ

Exhibit 2. Weekly Spot and Term Uranium Prices (US\$/lb)



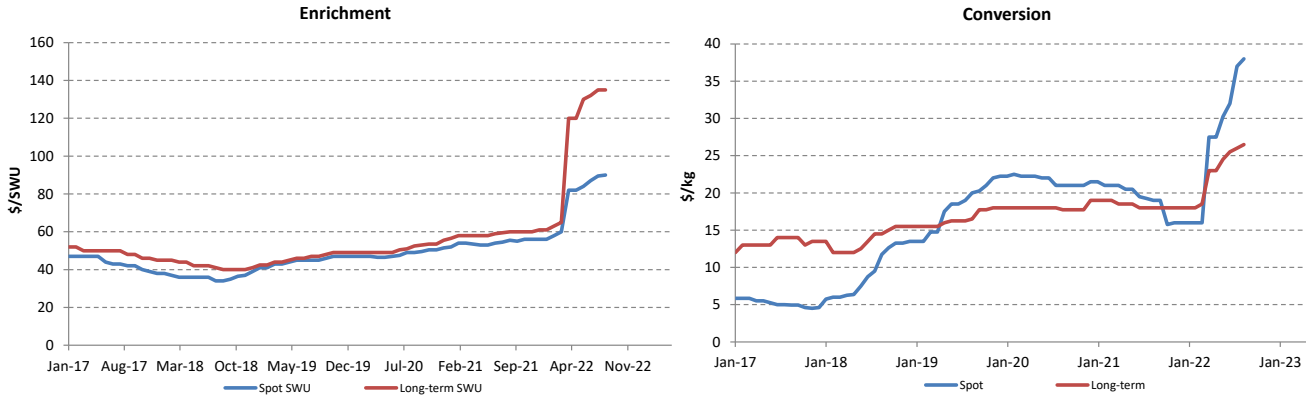
Source: UxC; TD Securities estimates

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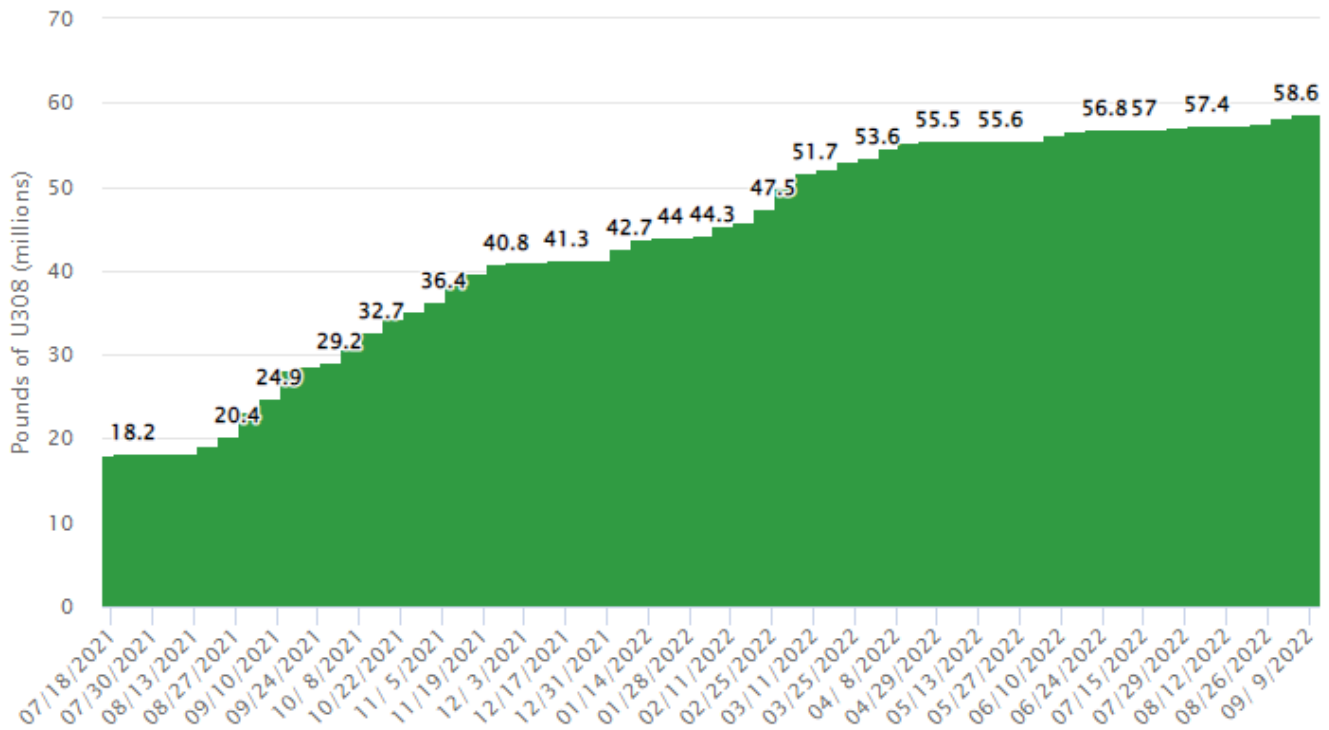
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Exhibit 3. Monthly SWU and Conversion Pricing



Source: UxC; TD Securities estimates

Exhibit 4. Sprott Physical Uranium Trust – Growth in Uranium Holdings Since July 2021



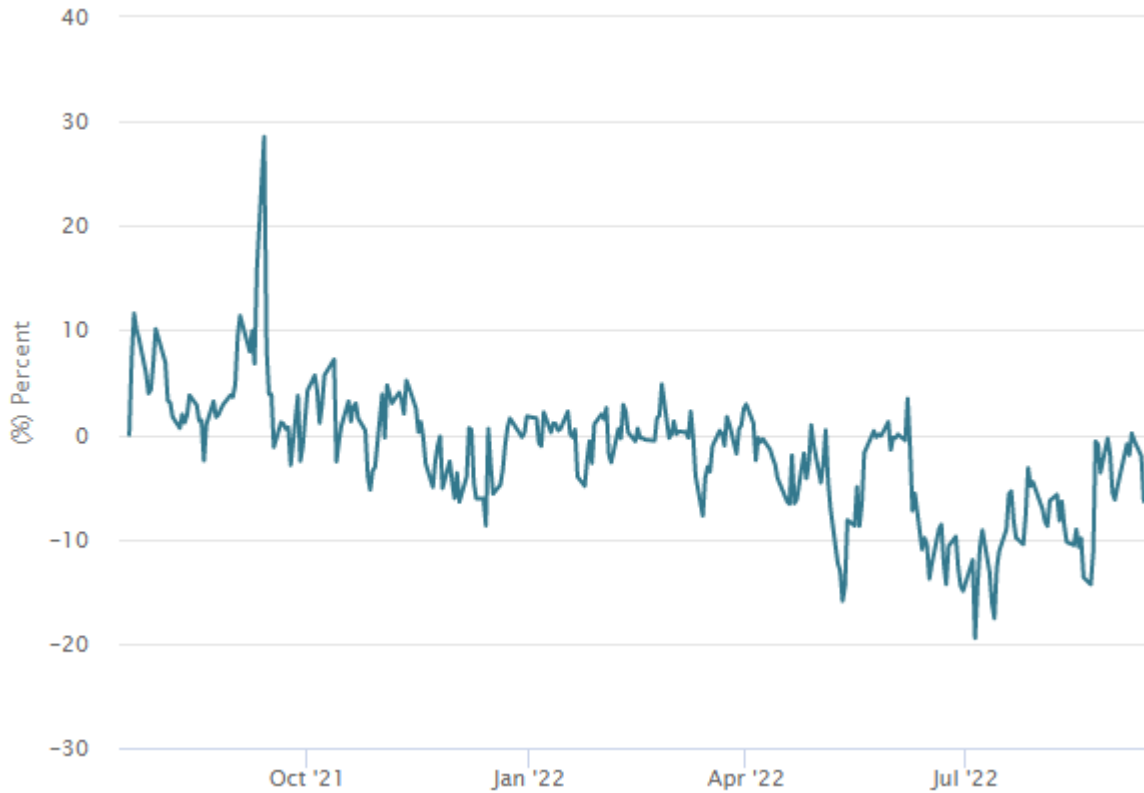
Source: Sprott Physical Uranium Trust

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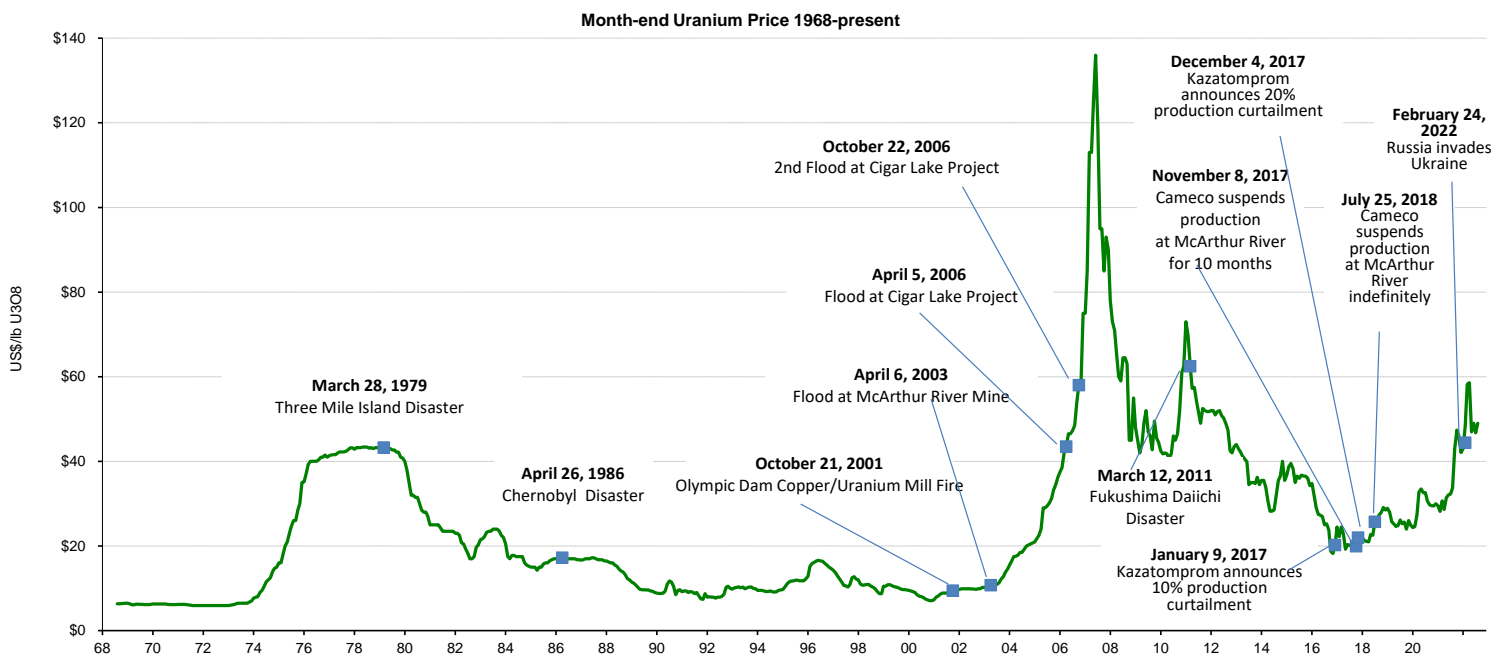
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Exhibit 5. Sprott Physical Uranium Trust – Premium/Discount to NAV Since July 2021



Source: Sprott Physical Uranium Trust

Exhibit 6. Uranium Price Since 1968 and Event Catalysts



Source: UxC, media reports, TD Securities estimates

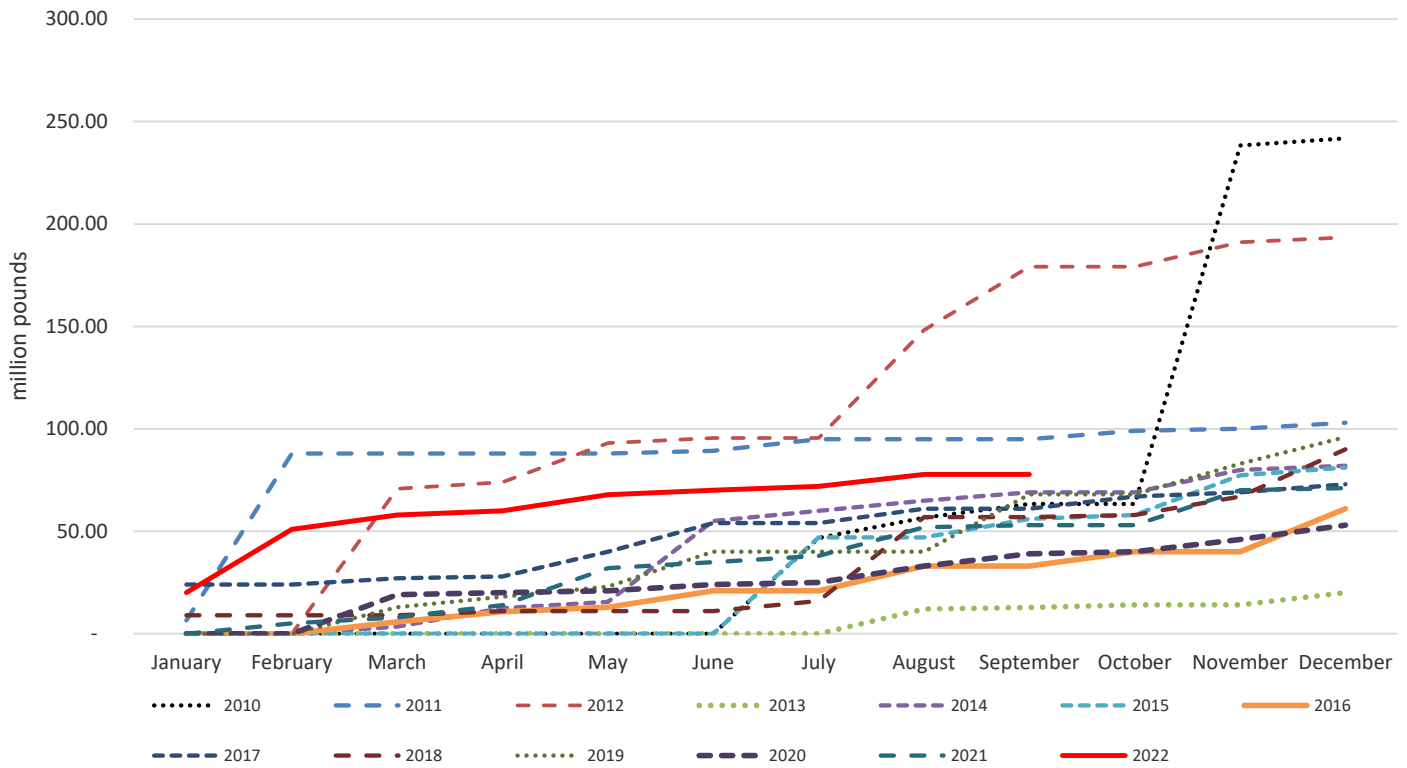


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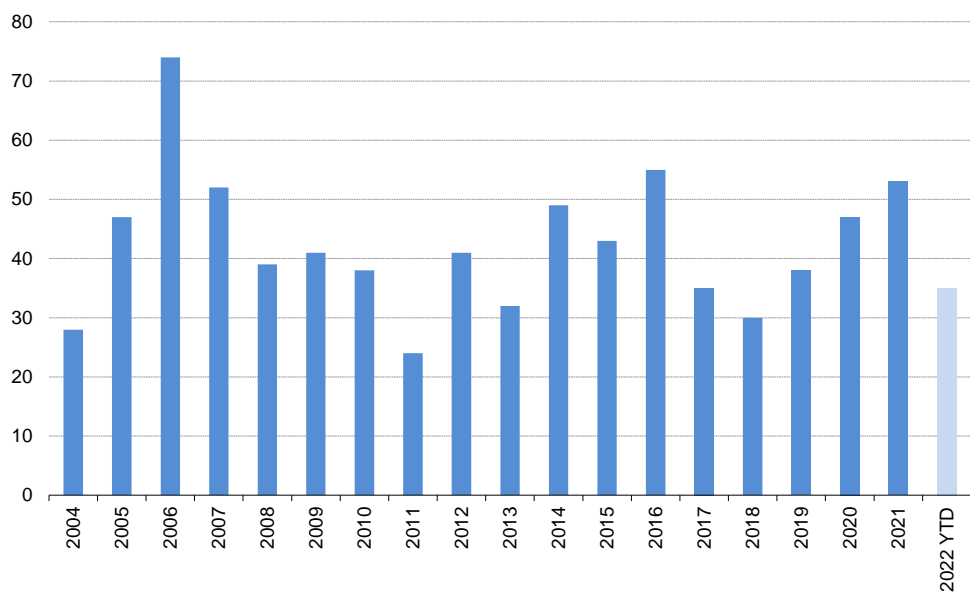
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Exhibit 7. Cumulative Annual Term Contracting Volumes



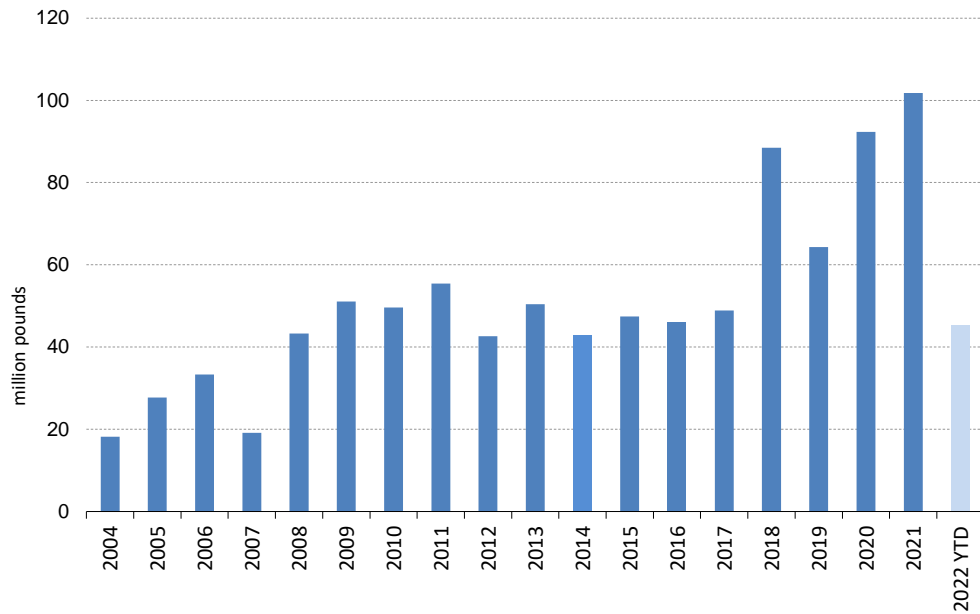
Source: UxC; TD Securities estimates

Exhibit 8. Annual Number of Term Contracts Signed



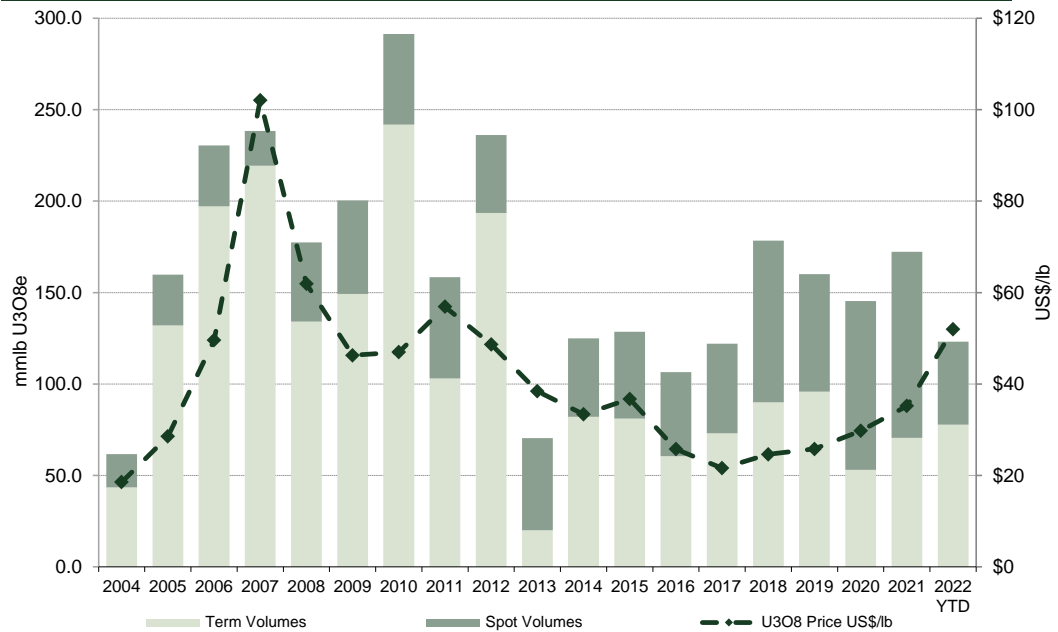
Source: UxC; TD Securities estimates

Exhibit 9. Annual Spot Uranium Market Volume



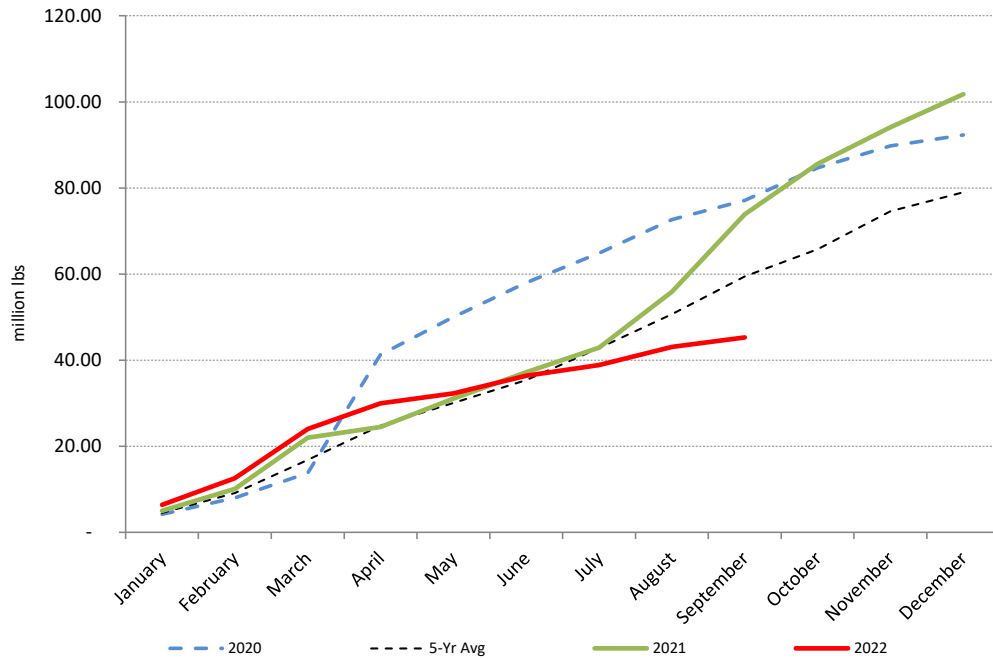
Source: UxC; TD Securities estimates

Exhibit 10. Spot and Term Volumes



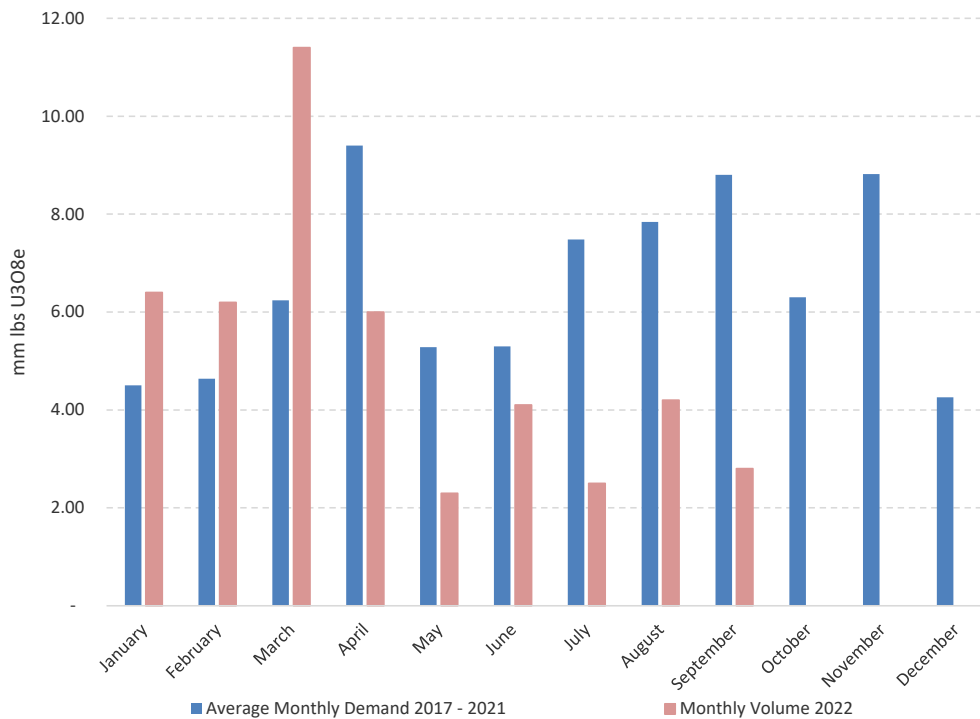
Source: UxC; TD Securities estimates

Exhibit 11. Historical vs. 2022 Cumulative Monthly Spot Volumes



Source: UxC; TD Securities estimates

Exhibit 12. Monthly Average Spot Volumes



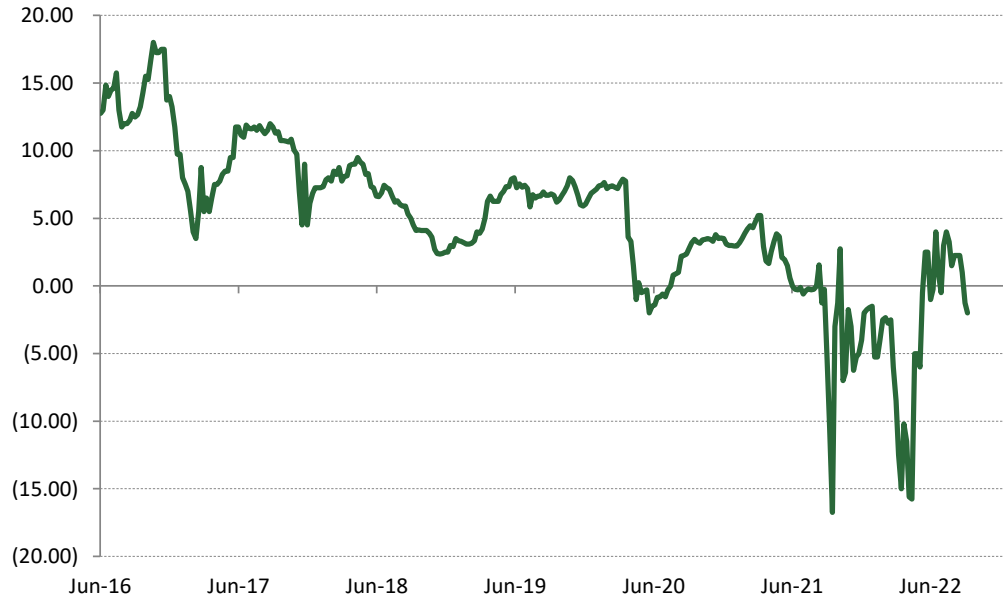
Source: UxC; TD Securities estimates

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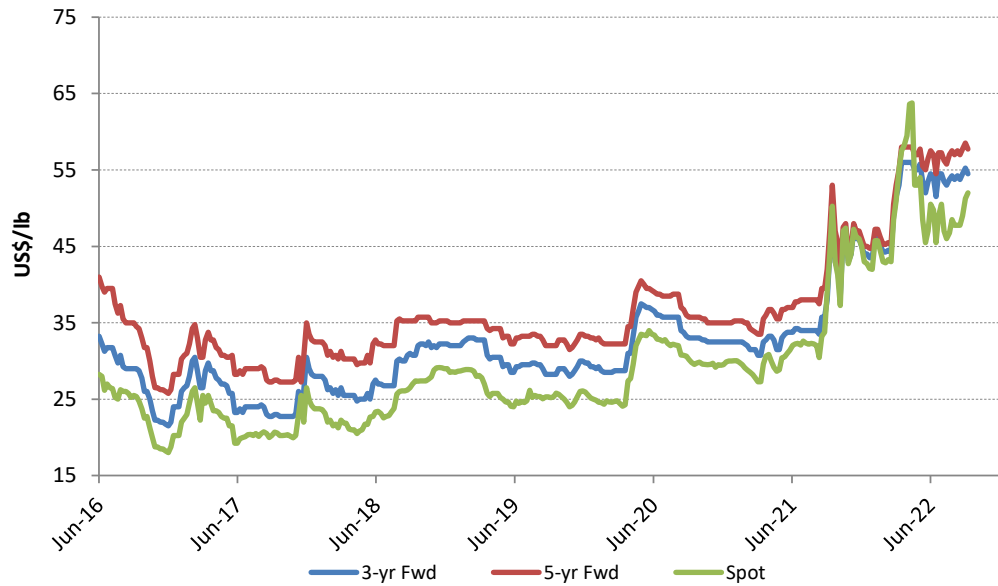
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Exhibit 13. Uranium Term Price Premium to Spot (US\$/lb)



Source: UxC; TD Securities estimates

Exhibit 14. Uranium Prices – Spot, 3yr Fwd and 5yr Fwd



Source: UxC

Exhibit 15. Fund Implied Price (FIP) and Spot Price



Source: UxC; TD Securities estimates

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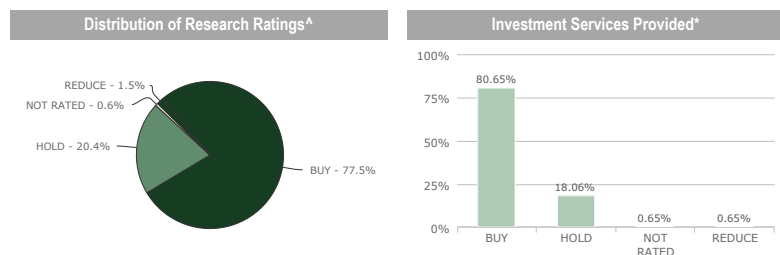
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