

## Exchange Traded Funds

## Have your yellowcake &amp; eat it too

Initial Opinion

**Correction in nuclear stocks offers a good entry point**

Nuclear power & uranium ETFs have corrected 10-15% from early February highs. Consider buying the dip given likely technical support (e.g. at \$27/share for URA - Exhibit 3). Uranium's third bull market has room to run given favorable valuations, substantial upside expected from our equity colleagues Lawson Winder and Jason Fairclough, and positive signals from our recent meeting with public policy and industry leaders.

**The market is embracing the nuclear energy option**

Nuclear stocks have outperformed the Nasdaq 100 by nearly 200% since COVID lows (Exhibit 6). Since 2021 clean energy ETFs with heavy exposure to wind and solar power have suffered a sharp bear market (>30% losses and \$2.4bn outflows), but over the same period investors added \$2bn into uranium & nuclear power ETFs.

**Invest based on physics, not politics**

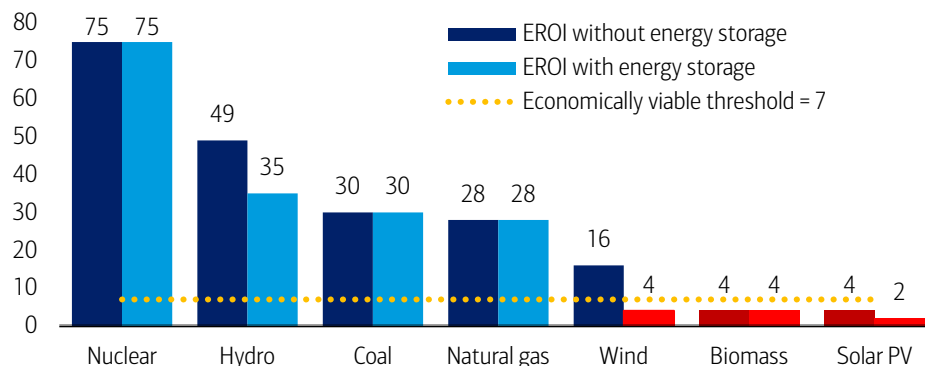
The structural bull case for uranium is intact. Nuclear power offers the highest energy returned on energy invested (EROI) of any source (Exhibit 2) and offers the most reliable baseload power. Uranium's global supply will likely be in a deficit over the next decade as demand soars. War, inflation, and energy security fears echo the 1970s/80s (Exhibit 10). 60 reactors are under construction globally today with another 425 planned or proposed.

**Adding NLR & restacking ratings; URA still the top pick**

URA is still our top pick with diversified exposure to uranium, miners, and others. We initiate coverage of NLR with a 1-FV rating (Exhibit 1). The fund is unique with 40% exposure to US nuclear-exposed utilities and strong risk-adjusted returns. XME is downgraded to a 2-FV and REMX is downgraded to 3-FV given weak fundamentals. See page 5 for full details.

**Exhibit 2: The most important chart in energy policy**

How many joules of output per joule of input? Energy returned on energy invested (EROI) by source



Source: BofA Research Investment Committee, D. Weißbach, G. Ruprecht, A. Huke, K. Czernski, S. Gottlieb, A. Hussein (2013); Red bars signal EROI below the economically viable threshold.

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27 February 2024

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United States  
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**Exhibit 1: URA & NLR are top-rated ETFs**

Summary of ratings changes

Ticker	Old rating	New rating
URA	1-FV	1-FV
NLR	-	1-FV
XME	1-FV	2-FV
PICK	3-FV	2-FV
REMX	2-FV	3-FV

Source: BofA ETF Research

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For more information:

[RIC Report: The nuclear necessity](#)

[URA: the third bull market in Uranium](#)

[CCJ: Uranium demand more durable than ever](#)

[CCJ: Bull market has further to run](#)

KAP: Warns on ramp = bullish uranium price

KAP: Downside risk to volumes

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Timestamp: 27 February 2024 02:11PM EST

# The best option for clean energy

We expect nuclear energy demand to rise as policy makers confront looming Net Zero deadlines and a more hostile global trade environment. The recent pullback in nuclear energy stocks provides a timely opportunity for investors looking to add exposure (see [The RIC Report: The nuclear necessity](#) for our deep dive).

## 1. The market opportunity

URA is in a correction, down 15% from early February highs. Our fundamental analysts expect recent weakness in the fund's large holdings like Cameco, Yellow Cake PLC, and Kazatomprom to be temporary.

Lawson Winder thinks [Cameco's 4Q23 earnings were solid](#) but unchanged production guidance may have dented the near-term outlook for uranium bulls.

In our view, the pullback in URA's price is an even more attractive buying opportunity. There looks to be strong price support around \$27/share for investors looking to add exposure (Exhibit 3).

### Valuations are favorable, with room to run

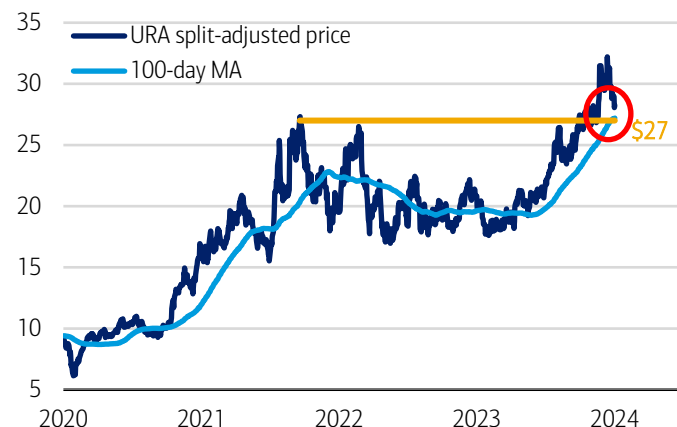
At 2.2x price to book, URA trades in-line with other clean energy peers and well below the S&P 500 (4.5x - Exhibit 4). Tech stocks trade more than 5.5 turns above URA.

The 1970s oil embargo and pre-GFC commodities boom illustrate the strength of past uranium bull markets.

Uranium's third bull market still has room to run thanks to supply deficits and attractive valuations (Exhibit 5). URA could rise another 100-200% if it traded at multiples similar to the industrials sector, even if forward earnings estimates remain unchanged.

### Exhibit 3: URA is in a buyable dip

URA price vs 100-day moving average and potential price level support

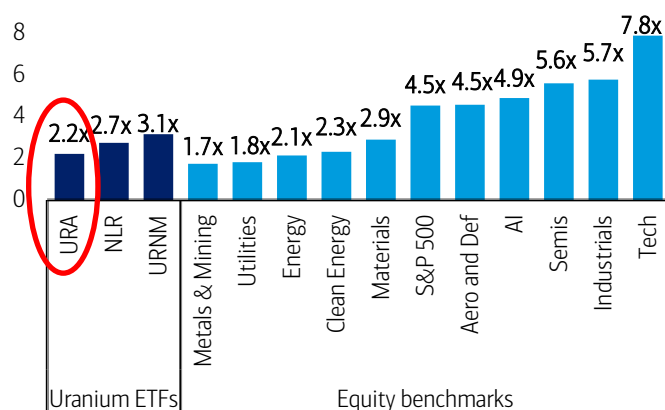


Source: BofA ETF Research, Bloomberg

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### Exhibit 4: Nuclear power ETFs are less expensive than most

Price to book for URA and other equity sectors

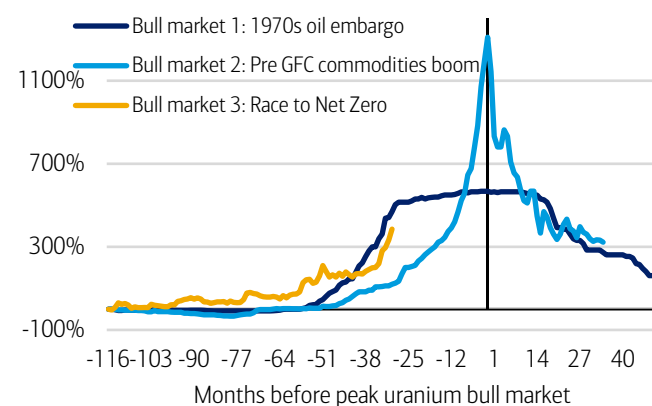


Source: BofA Research Investment Committee, Factset

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### Exhibit 5: Uranium's third bull market has room to run

Uranium prices around historical peaks



Source: BofA Research Investment Committee, Global Financial Data

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## The market believes in nuclear's potential

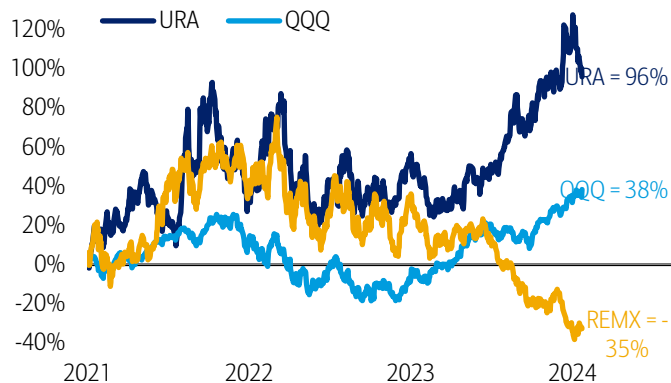
Nuclear energy stocks have a strong investor base. URA has outperformed the mighty Nasdaq 100 by nearly 60% since February 2021 (Exhibit 6).

Investors have made it clear that nuclear is the preferred clean energy option. Uranium funds have attracted \$2bn of inflows in the past two years while traditional clean energy ETFs like ICLN and PBW have notched \$2.4bn of outflows (Exhibit 7).

REMX's high exposure to lithium and China helps explain recent underperformance and outflows. [Dreams of an EV future](#) have turned into nightmares following FY23 results for large miners. Lithium is down roughly -85% as future for battery metals remains unclear. Miners, and battery metals specifically, are reliant on the Chinese economy. As it stands, the market is indicating it has significant doubts over China's economy and policy response in 2024.

#### Exhibit 6: Big Tech is no match for nuclear

Cumulative total returns for URA & QQQ since March 2020

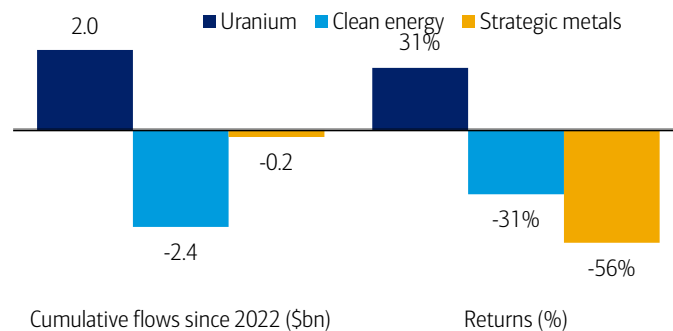


Source: BofA ETF Research, Bloomberg

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#### Exhibit 7: The market has embraced the nuclear energy option

ETF category flows & returns since Dec 2021



Source: BofA ETF Research, Bloomberg. Note: Uranium = URA, URNM, NLR; Clean Energy = ICLN, QCLN, PBW, SMOG; Strategic metals = REMX

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## 2. The market necessity

Nuclear power is a proven technology that can provide cheap, reliable, clean, and safe power as a bridge to renewable sources if/when they become ready at a larger scale.

- **Cheap:** nuclear energy payback, as measured by the “energy return on investment” (EROI), is in a league of its own (Exhibit 2). Other energy sources like wind, biomass, and non-concentrated solar may not be economically viable without perpetual subsidies. One academic study argued that EROIs around 30 or larger are required to achieve what is perceived as economic prosperity in the 21<sup>st</sup> century.<sup>1</sup>

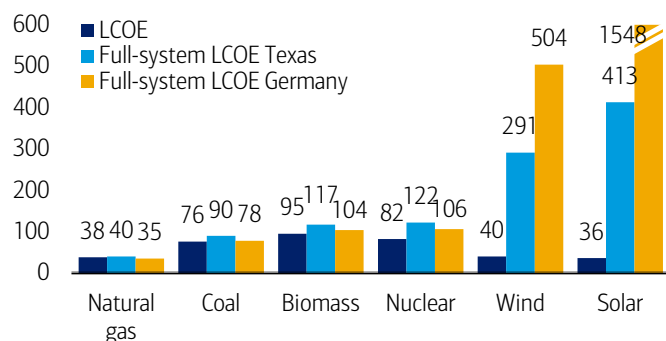
Nuclear also looks to be the cheapest scalable, clean energy source when accounting for “full system” costs like efficiency, storage, and transmission (Exhibit 8).

- **Reliable:** “baseload” power is crucial for energy security. Nuclear plants generate energy 93% of the time, on average, vs. just 57% for natural gas, 35% for wind, and 25% for solar (Exhibit 9).
- **Clean:** nuclear power has some of the lowest lifecycle greenhouse gas (GHG) emissions of any energy source and needs much less material to build. Nuclear requires about 900 tons of cement, concrete, and glass per TWh of electricity generated while solar requires >16,000 tons of material for the same output.
- **Safe:** Nuclear energy, solar, and wind have all caused essentially no deaths from routine operation. Containment methods have evolved to mitigate disaster risks.

<sup>1</sup>Weissbach, D. et al., Energy intensities, EROI (energy returned on invested), for electric energy sources, 2018

**Exhibit 8: Nuclear & conventional costs are far lower than wind & solar**

Levelized full system cost of electricity by energy source; \$ per MWh

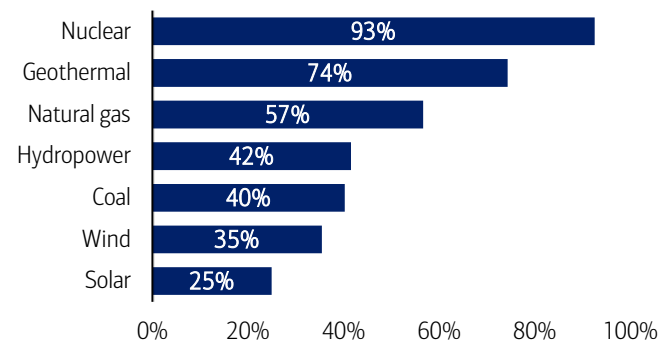


Source: BofA Research Investment Committee, Robert Idel, Energy 259 (2022)

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**Exhibit 9: Nuclear is the most efficient energy source**

Capacity factor by energy source



Source: BofA Research Investment Committee, Office of Nuclear Energy

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- **Building like it's 1979:** Resource nationalism, energy security, war and inflation echo the nuclear build-out of the 1970s/80s. Global nuclear plant capacity grew between 1955 & 1980. The 1980s alone saw 195 plant additions globally after two oil crises, rampant inflation, and concerns over energy security (Exhibit 10). Recently at COP28, more than 20 countries have launched a declaration to triple nuclear energy capacity by 2050. Increasing nuclear plants globally has been recognized as a crucial step for Net Zero goals.

- **A decade of uranium deficits:** Underinvestment has plagued uranium mining projects. Our metals strategists believe global mine production will not be able to keep pace with uranium demand and commercial inventories will be needed to plug the gap. Their forecast implies a deficit of 60 million pounds in 2035 (Exhibit 11).

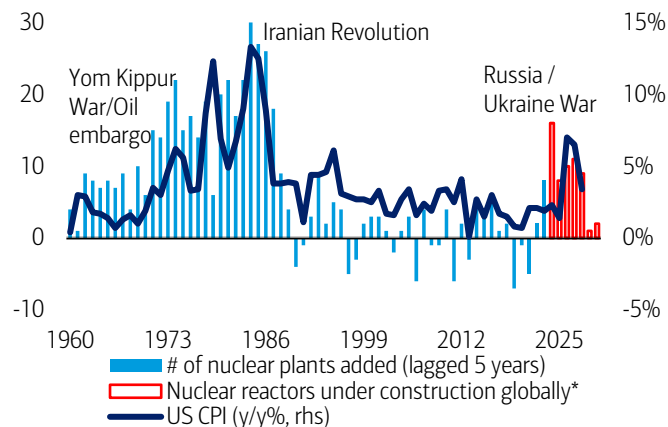
Kazatomprom, the world's largest uranium producer, recently warned of lower production in the next few years, which means the market could see deficits sooner than previously expected. Demand will also likely rise. The IEA suggests that nuclear power will have to nearly double by 2050 to meet net zero goals. There are currently 60 nuclear reactors under construction globally with 100 more planned and 325 proposed.

- **The policy shift:** We presented at a recent conference hosted by the Nuclear Energy Institute and meetings with senior industry and public policy officials were promising. Conversations were focused not on whether to promote more nuclear power in the US, but on what combinations of policy and financing might unlock private sector investment. Given bottlenecks in Congress, no major package is likely soon, but participants raised several interesting avenues including the redesignation of already-passed IRA funding, the use of carbon credits to fund projects, using NRC and workforce expertise from Vogtle to build another AP1000, and funding smaller-scale SMR and micro-reactors through state and local budgets.
- **Uranium in the crosshairs:** We highlighted in our [Year Ahead](#) report that 77% of major government spending packages has yet to be spent, leaving billions of dollars with an uncertain future in an election year.

Looking abroad, the US continues to rely on Russia uranium supplies. In the end of 2023, the US House of Representatives passed legislation that would ban buying Russian uranium for American reactors. Any Russian dependence leaves the US vulnerable to sanctions and geopolitical conflicts.

**Exhibit 10: War and inflation = nuclear power resurgence**

US CPI vs global operational nuclear plants added on an annual basis

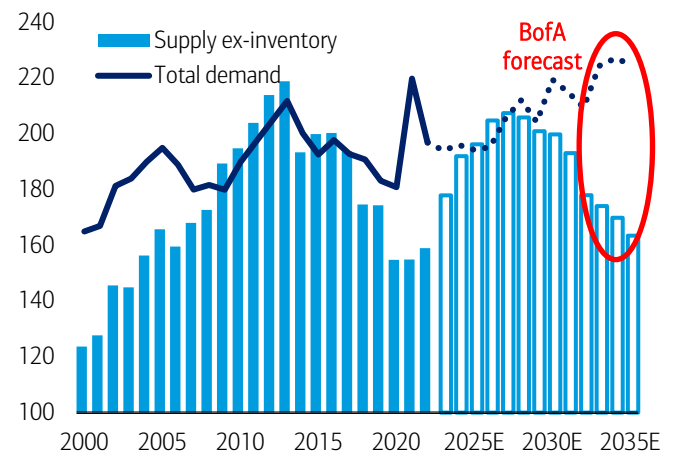


Source: BofA Research Investment Committee, World Nuclear Association, Statista. \*Year = expected year of grid connection

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**Exhibit 11: Uranium market may become unbalanced**

BofA uranium supply / demand forecast through 2035, million pounds



Source: BofA Global Research

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**3. The market options**

We include uranium ETFs in our metals and mining coverage. URA and NLR are our top picks as nuclear energy is embraced as a clean energy solution.

**Exhibit 12: Metals & Mining ETFs - ratings/scores/factors**

Summary of covered ETF Efficiency, Technical, and Fundamental characteristics

Ticker Name	Total Rating	Score	Efficiency				Technical		Fundamental		
			Expense ratio	NAV tracking difference	Bid/Ask spreads	Daily value traded (\$mn)	Price momentum	Sortino ratio	%Buy	%U/P	Ratio
URA Global X Uranium ETF	1-FV	86	0.69%	0.19%	0.04%	77	0.0%	1.1	40%	2%	90%
NLR VanEck Uranium + Nuclear Energy ETF	1-FV	72	0.61%	1.11%	0.42%	3	0.1%	1.0	48%	4%	74%
XME SPDR S&P Metals & Mining ETF	2-FV	63	0.35%	0.06%	0.02%	169	1.7%	0.8	18%	4%	31%
PICK iShares MSCI Global Metals & Mining Producers ETF	2-FV	55	0.39%	4.08%	0.25%	9	-2.8%	0.4	55%	10%	54%
REMX VanEck Rare Earth/Strategic Metals ETF	3-FV	11	0.54%	3.78%	0.58%	6	-15.6%	-0.2	23%	7%	26%
Average			0.52%	1.84%	0.26%	53	-3.32%	0.6	37%	5%	55%

Source: BofA ETF Research, Factset, Bloomberg. Total score out of 100 possible points.

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**Top rated funds: uranium takes the cake**

Individual uranium miners and related companies can be very volatile, so a well-diversified portfolio is easier to own. We published a report including in-depth analysis of our uranium funds in May 2023 with [more information](#).

- **URA (1-FV)**, the Global X Uranium ETF, seems to be the most diverse Uranium fund of its peers given 1) significant exposures to several sectors; 2) diverse country exposures; and 3) the highest number of individual holdings. These attributes contribute to the fund having the best risk adjusted returns. While more expensive than NLR, URA is more liquid and as a higher direct exposure to physical uranium.
- **NLR (1-FV)**, the VanEck Uranium + Nuclear energy ETF, offers investors a different approach to nuclear exposure. Our newest initiation is unlike other uranium ETFs: NLR's highest concentration is in utilities, accounting for nearly 40% of the fund. Despite sector differences to URA, strong demand for uranium still drives strong risk adjusted returns and a high exposure to BofA buy-rated stocks.

**Other funds: Out with the old**

- **XME (2-FV)**, the SPDR S&P Metals & Mining ETF, offers 100% exposure to North American stocks. Formerly a top-rated fund, XME has fallen behind with no exposure to top uranium producers. For investors interested in a traditional approach to

metals and mining, XME is the cheapest fund in our metal and mining coverage and offers the best risk adjusted returns outside of uranium funds.

- **PICK (2-FV)**, the iShares MSCI Global Metals & Mining Producers ETF, is upgraded from a 3-FV. The fund offers broader geographic exposure than traditional metals and mining peers, with the highest Europe and Latin America exposure, and only a 2% exposure to China. The resilience of US markets relative to the rest of the world has led to PICK's lower risk adjusted returns relative to XME. Investors interested in adding metals and mining exposure with an emerging markets tilt may be interested in PICK. BofA analysts anticipate that when the Fed finally decides to cut, emerging market equities should benefit.
- **REMX (3-FV)**, the VanEck Rare Earth/Strategic Metals ETF, is downgraded to a 3-FV. It primarily holds rare earth mining companies. Rare earth metals like lanthanum, neodymium, and cerium are integral components in electronics, including semiconductors and smartphones. The fund's underperformance is attributable to its >20% China exposure. Historically, China's economy has contributed significantly to returns and volatility. Further, falling expectations of electric vehicle demand lessen the need for the specific metals targeted by REMX. As a result, REMX is our bottom rated fund.

## Appendix

### Understanding our evaluation process

BofA Global Research ETF ratings include both a view on the broad category (FV=Favorable View; NV=Neutral View; UF=Unfavorable View) and the specific fund relative to its peers (1=More Attractive; 2=Attractive; 3=Less Attractive).

We evaluate individual funds in three categories: Efficiency, Technical, and Fundamental. These first two groups use similar criteria across ETF categories:

- **Efficiency:** includes expense ratio, tracking error, and liquidity.
- **Technical:** focuses on price momentum and risk-adjusted returns via the Sortino Ratio (returns vs downside volatility).

Our **Fundamental** ranking is typically determined by a combination of fund exposure to BofA equity analyst Underperform-rated names and Underweight industries.

### Understanding the ETF model output

ETF reports typically include a ratings table summarizing the key elements used to rate ETFs within a category. We provide a description of each column below within the context of our government bond ETF model:

- **Rating:** The number represents the view on a specific fund (1=More Attractive; 2=Attractive; 3=Less Attractive). The letters represent the category outlook (FV=Favorable; NV=Neutral; UF=Unfavorable).
- **Total score:** Funds are rated on a 100-point scale. Each category (Efficiency, Technical, and Fundamental) has points available equivalent to the category's weight in the ranking. For example, if Efficiency was 33% of the overall score, a fund could achieve a maximum of 33 points in the Efficiency category. Funds are ranked against each other to determine the number of points received per category. The scores for each category are then summed to arrive at the total score.
- **Fundamental rank:** Funds were ranked using buy rated vs underperform rated exposure to covered BofA names as well as weight to BofA identified water thematic names.

- **Price momentum:** Three simple moving averages are used to calculate price momentum. We weight and sum the percent that a fund's closing price is above or below each moving average. A higher weighted percentage = stronger momentum.
- **Sortino ratio:** is used to measure risk-adjusted returns by comparing average annualized returns to downside deviation over the same period. Funds that have shown the highest returns relative to average pullbacks receive a higher rank.
- **Expense ratio:** The "all-in" net-expenses of a fund including management, interest, listing fees etc. as a percent of net assets under management.
- **Tracking error:** measures the difference in actual performance of a fund relative to its corresponding benchmark.
- **Average value traded:** The average number of shares traded daily multiplied by the price that they traded at over the past three months. A higher number indicates greater liquidity and better efficiency. Funds with an average value traded greater than the group's median received a higher Efficiency score.
- **Bid/Ask spread:** The average difference, or spread, between bid and ask prices as a percentage of the price. A lower spread signals a more liquid, and efficient, fund.

### Exhibit 13: ETFs mentioned

List of ETFs mentioned in report with name, rating, and price

Ticker	Name	Rating	Price
URA	Global X Uranium ETF	1-FV	28.41
NLR	VanEck Uranium + Nuclear Energy ETF	1-FV	72.57
XME	SPDR S&P Metals & Mining ETF	2-FV	55.88
PICK	iShares MSCI Global Metals & Mining Producers ETF	2-FV	39.29
REMX	VanEck Rare Earth/Strategic Metals ETF	3-FV	48.79

Source: BofA ETF Research, Bloomberg

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## Analyst Certification

I, Jared Woodard, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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BofA Securities is currently acting as a Financial Advisor to Canadian Solar Inc in connection with its subsidiary Recurrent Energy LLC's secured preferred equity investment commitment, convertible into common equity, for Recurrent Energy BV from BlackRock Inc through a fund managed by its Climate Infrastructure business, which was announced on January 23, 2024.

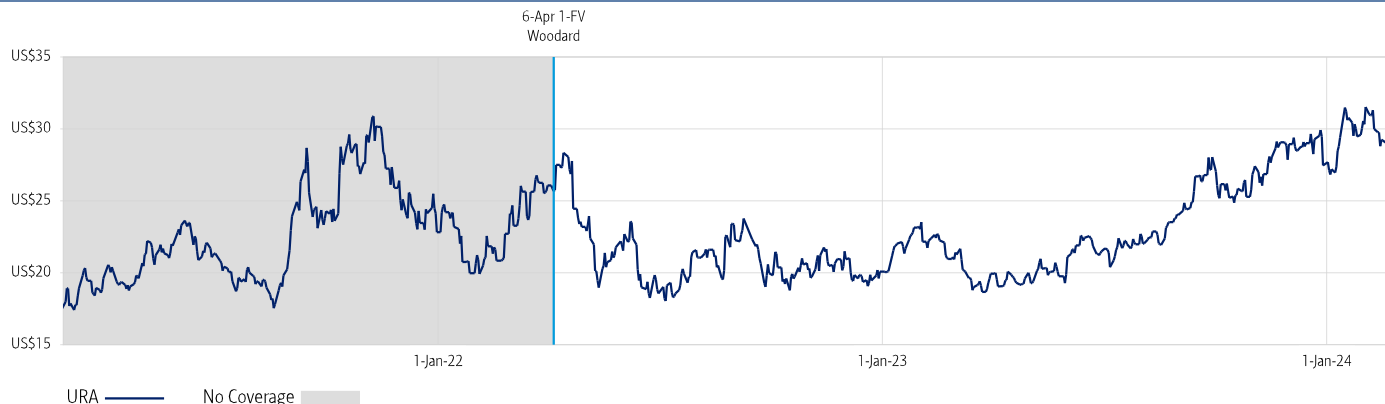




# Disclosures

## Important Disclosures

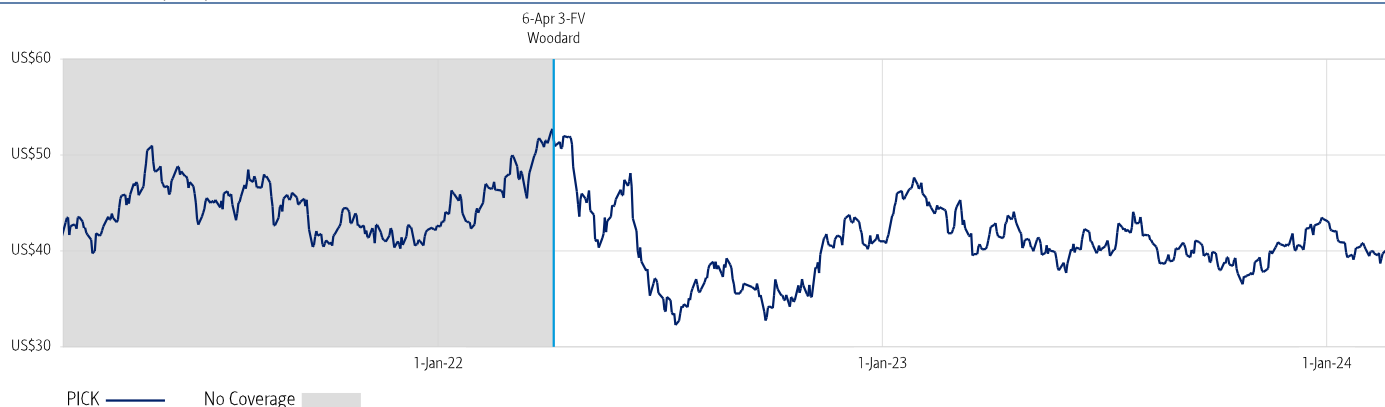
### Global X Uranium ETF (URA) Price Chart



1-FV, 2-FV, 3-FV, 1-NV, 2-NV, 3-NV, 1-UF, 2-UF, 3-UF – refer to Opinion Key below, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Exchange-Traded Fund Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

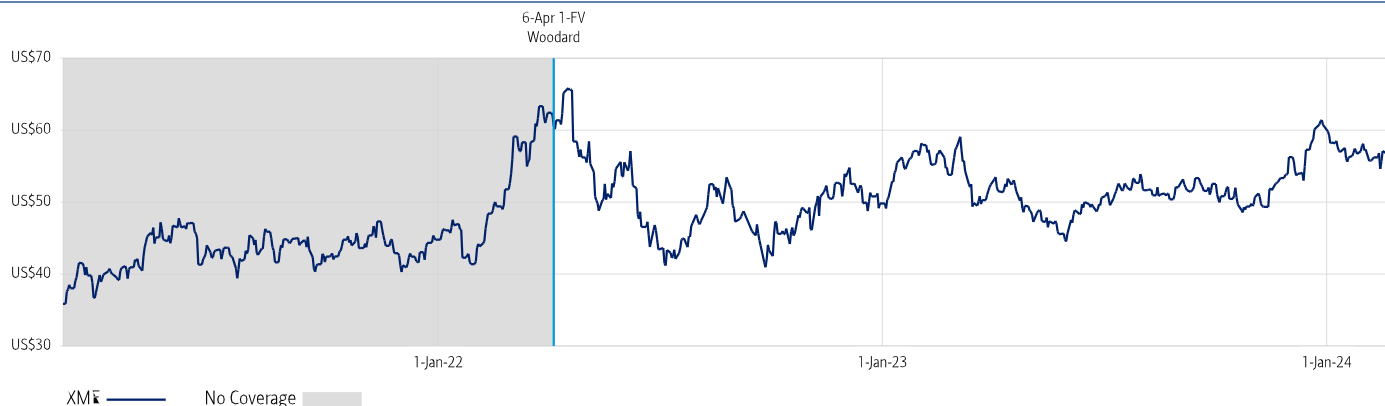
### iShares MSCI M&M ETF (PICK) Price Chart



1-FV, 2-FV, 3-FV, 1-NV, 2-NV, 3-NV, 1-UF, 2-UF, 3-UF – refer to Opinion Key below, NR: No Rating

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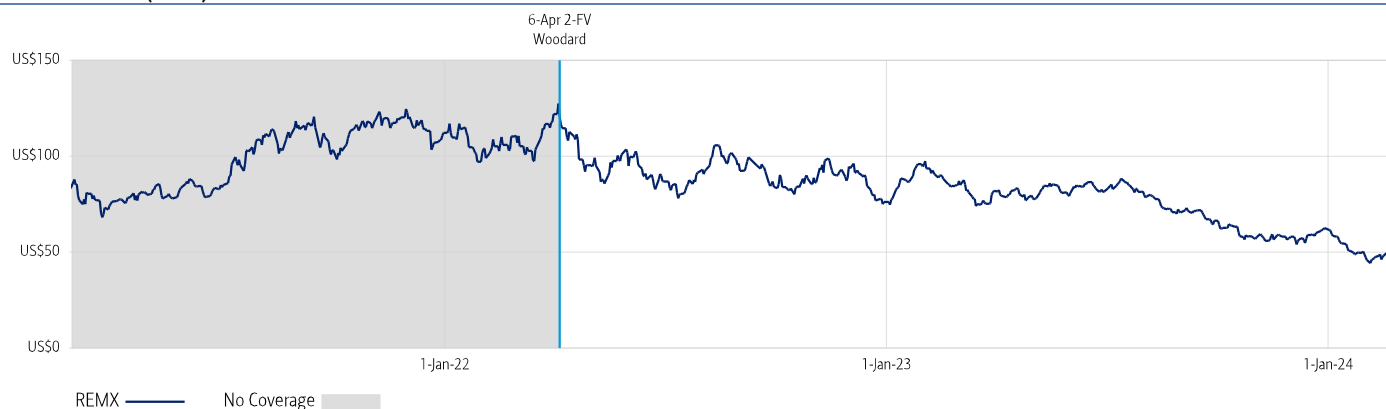
### SPDR S&P Met&Min (XME) Price Chart



1-FV, 2-FV, 3-FV, 1-NV, 2-NV, 3-NV, 1-UF, 2-UF, 3-UF – refer to Opinion Key below, NR: No Rating

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**SPDR S&P Met&Min (XME) Price Chart****VanEck Rare Mtls ETF (REMX) Price Chart**

1-FV, 2-FV, 3-FV, 1-NV, 2-NV, 3-NV, 1-UF, 2-UF, 3-UF – refer to Opinion Key below, NR: No Rating

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**Exchange-Traded Funds Investment Rating Distribution: Global Group (as of 31 Dec 2023)**

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	80	19.61%	Buy	53	66.25%
Hold	317	77.70%	Hold	241	76.03%
Sell	11	2.70%	Sell	7	63.64%

<sup>R1</sup> Exchange-traded funds (ETFs), or the ETF providers, that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only ETFs. An ETF rated 1-FV is included as a Buy; an ETF rated 2-FV, 3-FV, 1-NV, 2-NV, 3-NV, 1-UF or 2-UF is included as a Hold; and an ETF rated 3-UF is included as a Sell.

EXCHANGE-TRADED FUNDS (ETF) INVESTMENT OPINION KEY: Opinions reflect both an Outlook Rating and a Category Rating. OUTLOOK RATINGS reflect the analyst's assessment of the ETF's attractiveness relative to other ETFs within its category (including sector, region, asset class, thematic, and others). There are three outlook ratings: 1 - the ETF is more attractive than covered peers in the same category over the next 12 months; 2 - the ETF is similarly attractive to covered peers in the same category over the next 12 months; and 3 - the ETF is less attractive than covered peers in the same category over the next 12 months. CATEGORY RATINGS, indicators of the analyst's view of the ETF's category and which incorporate published views of BofA Global Research department analysts, are: FV - Favorable view, NV - Neutral view and UF - Unfavorable view.

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