

# - Thematic ETF Report December 2023



## Thematic Investing: Harnessing Disruption in Portfolios

**Thematic Investing** brings a rigorous and research-driven approach to harnessing **structural changes** around the world. It seeks to identify powerful **macro-level trends** and the **companies that stand to benefit** from the materialisation of those trends.

### General Process

#### Top Down

Identify disruptive macro-level trends and select related high-conviction themes



#### Bottom Up

Select investments highly exposed to those themes and related trends

### Characteristics

- **Long-term, growth-focused** strategies
- **Unconstrained** by geographies & sectors
- **Concentrated**, often in tech & new consumer
- **Relatable** concepts that impact our daily lives

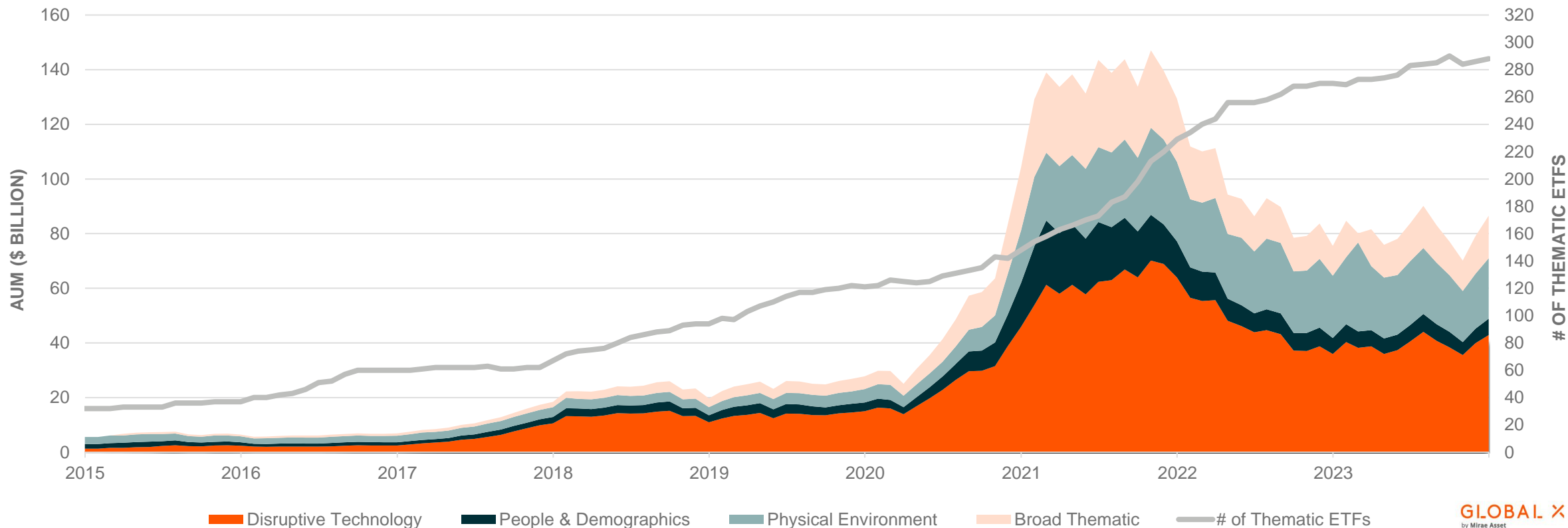
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# Defining & Categorizing Themes: Global X's Classification System

Category	Mega-Theme	Theme	Sub-Theme
<b>Disruptive Technology</b>	<b>Big Data</b>	Machine/Deep Learning	
		Cybersecurity	
		Quantum Computing	
		Cloud/Edge Computing, MarTech	Remote Work
	<b>Mobility</b>	Autonomous Vehicles	
		Electric Vehicles, Charging Infrastructure	Lithium Batteries
	<b>Digital Experiences</b>	AR/VR	
		Video Games	E-sports
		Social Media	
	<b>FinTech</b>	Streaming	
Mobile Payments			
Peer-to-Peer Lending			
Crowdfunding			
<b>Connectivity</b>	Blockchain		
	Digital Infrastructure		
	5G/Next Gen Networking		
	Emerging Markets Internet		
	Internet of Things	Smart Devices/ Smart Cities IoT	
<b>Robotics</b>	Space/Satellite Communications		
	AI/Automation		
	3D Printing		
<b>Prop-Tech</b>	Drones		
<b>Defense Tech</b>			
<b>People &amp; Demographics</b>	<b>New Consumers</b>	Millennials & Gen Z	
		Emerging Market Consumers	
		E-Commerce	
		Education	
		Sharing/Gig Economy	
		Safety and Security	
		Cannabis	
		Sports Betting	
	<b>Health</b>	Professional Sports	
		Urbanization	
<b>Health</b>	Healthcare Innovation	Telemedicine & Digital Health, Genomics, Immunotherapy, Public Health	
	Aging Population	Senior Care, Senior Economy	
	Health & Wellness	Obesity, Organics	
	Emerging Markets Healthcare		
<b>Health</b>	Alternative Medicine		
<b>Physical Environment</b>	<b>Climate Change</b>	Cleantech	
		Clean & Renewable Energy	Solar, Wind, Hydrogen
		Resource Scarcity	Water, Waste/Recycling, Sustainable Food
		Green Building	
	<b>Disruptive Materials</b>		
<b>Infrastructure Development</b>			

## Thematic ETF Landscape

At the end of December 2023, there were 288 thematic ETFs totaling \$86.6 billion in assets under management (AUM), up +9.4% from November 2023 and up +14.6% from the same month last year.



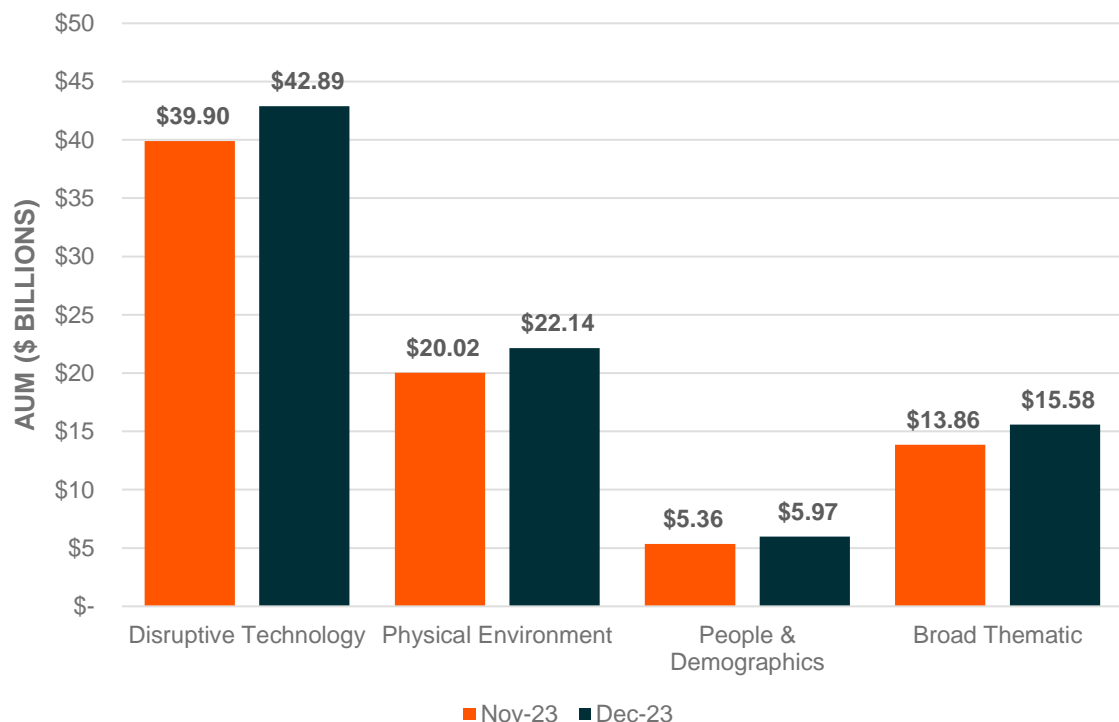
Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: AUM includes assets of funds closed until the last month of trading activity.

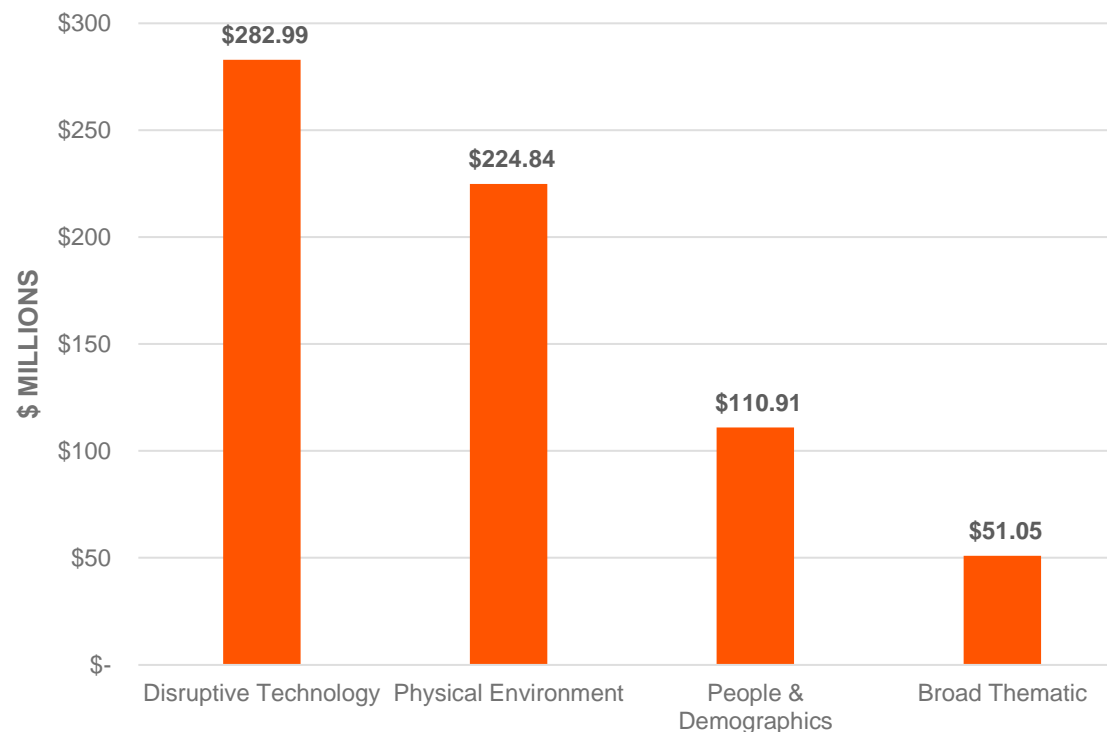
## Thematic ETF Landscape: AUM & Flows

In December, there was an increase in AUM and net inflows across the three categories. Disruptive Technology is the category that observed the highest inflows, exceeding +\$280 million.

AUM by Category



Monthly Flows by Category

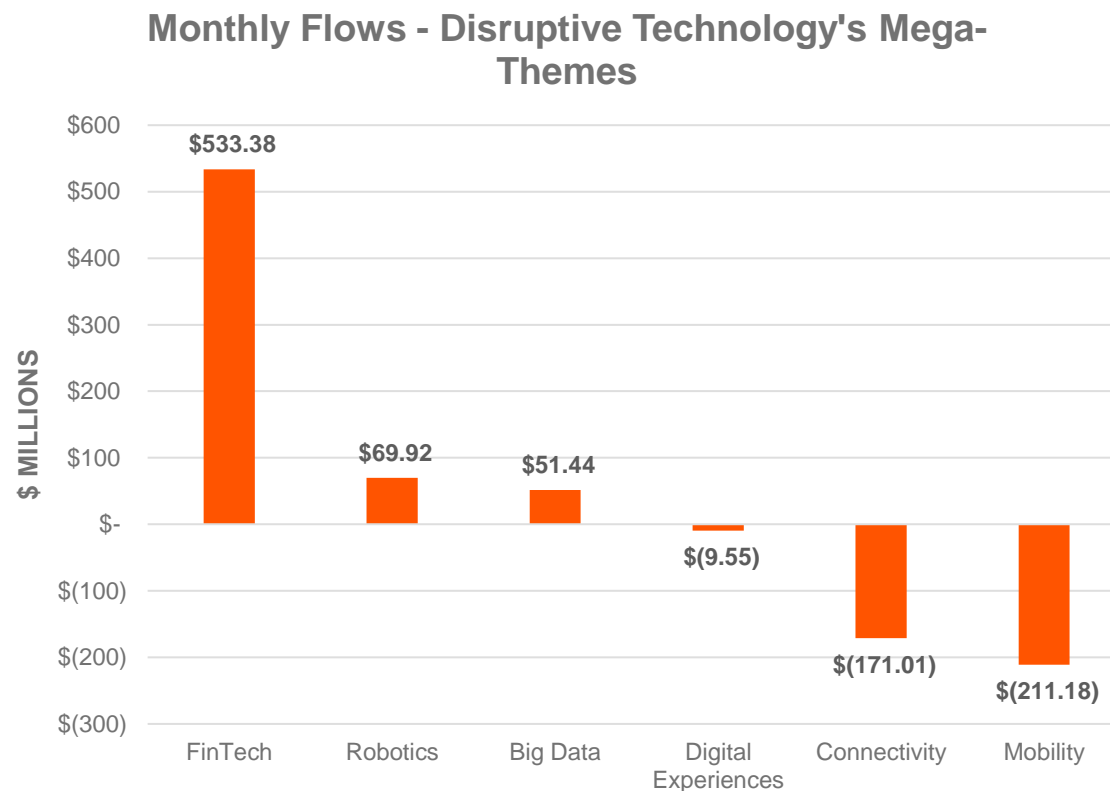
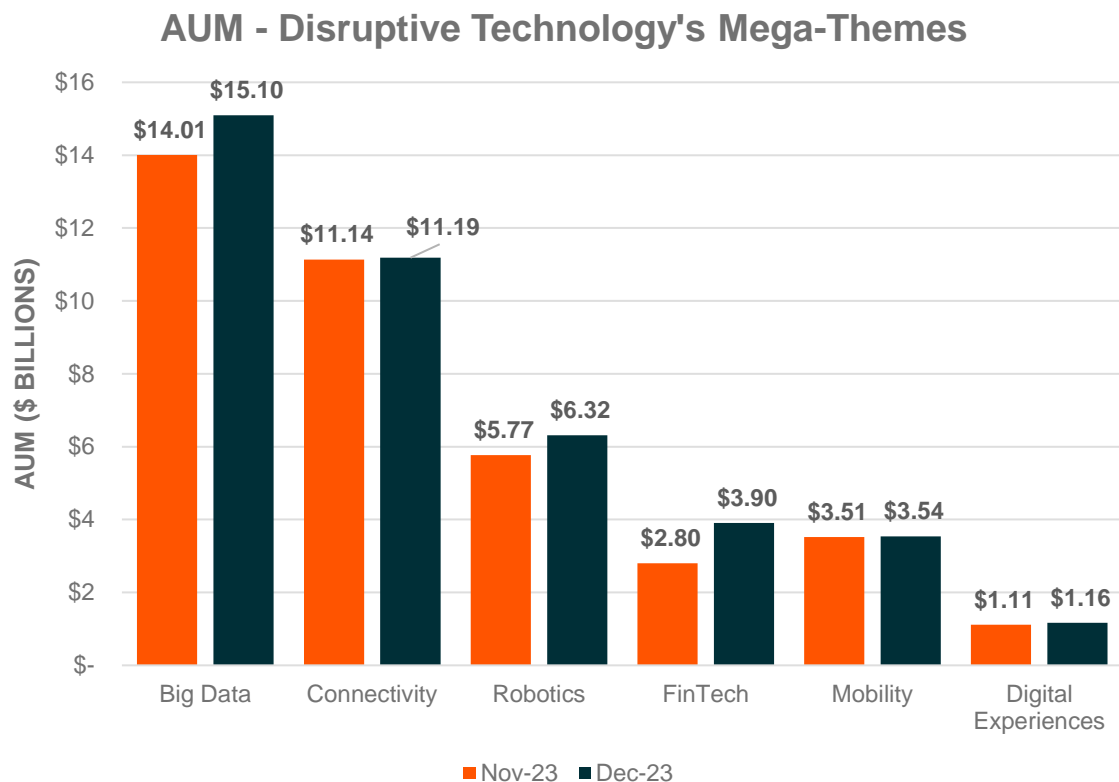


Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: AUM includes assets of funds closed until the last month of trading activity.

## Thematic ETF Landscape: AUM & Flows

All of the Mega-Themes related to Disruptive Technology experienced an increase in their AUM throughout the month. FinTech (+\$533 million), Robotics and Big Data are the Mega-Themes that showed inflows in December.



Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: AUM includes assets of funds closed until the last month of trading activity.

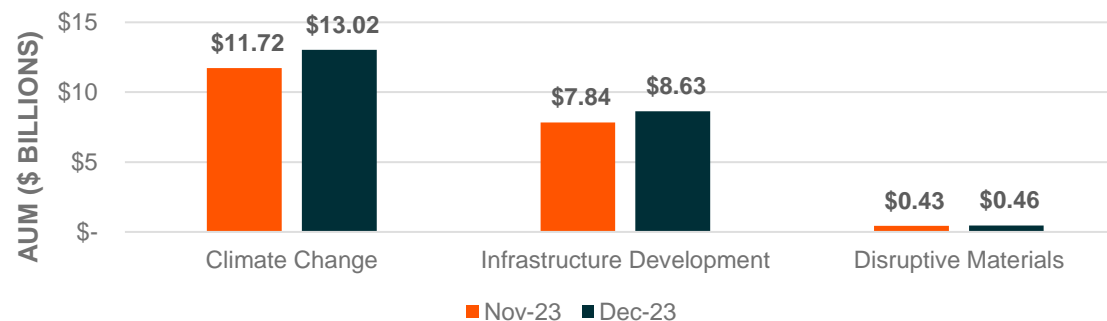
## Thematic ETF Landscape: AUM & Flows

AUM in Mega-Themes related to People & Demographic and Physical Environment increased. Health, Climate Change and Infrastructure Development experienced inflows throughout the month.

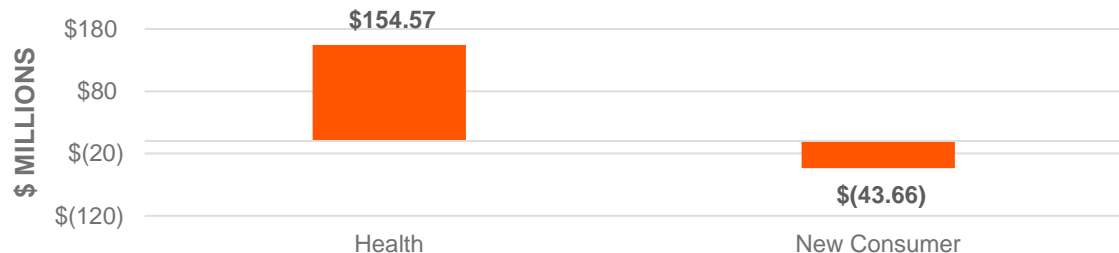
### AUM – People & Demographic's Mega-Themes



### AUM – Physical Environment's Mega-Themes



### Monthly Flows – People & Demographic's Mega-Themes



### Monthly Flows – Physical Environment's Mega-Themes



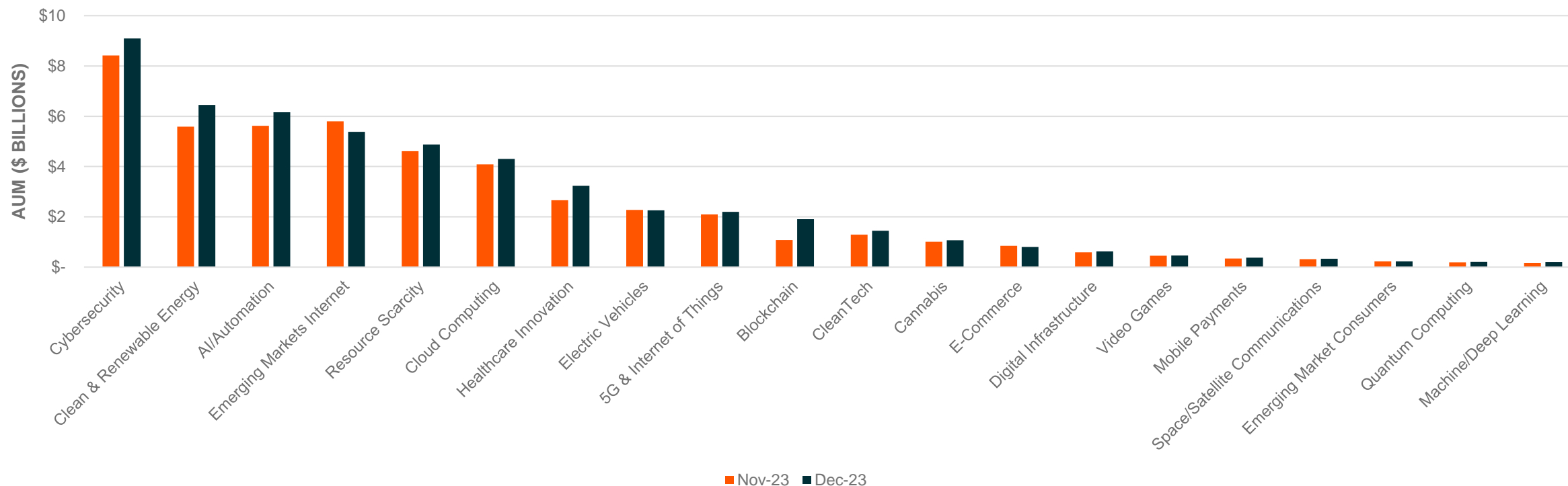
Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: AUM includes assets of funds closed until the last month of trading activity.

## Thematic ETF Landscape: AUM & Flows

On a theme level, most Themes exhibited an increase in AUM. Exceptions include Emerging Markets Internet, Electric Vehicles, and E-Commerce. The theme with the highest AUM increase was Clean & Renewable Energy.

AUM by Themes



Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

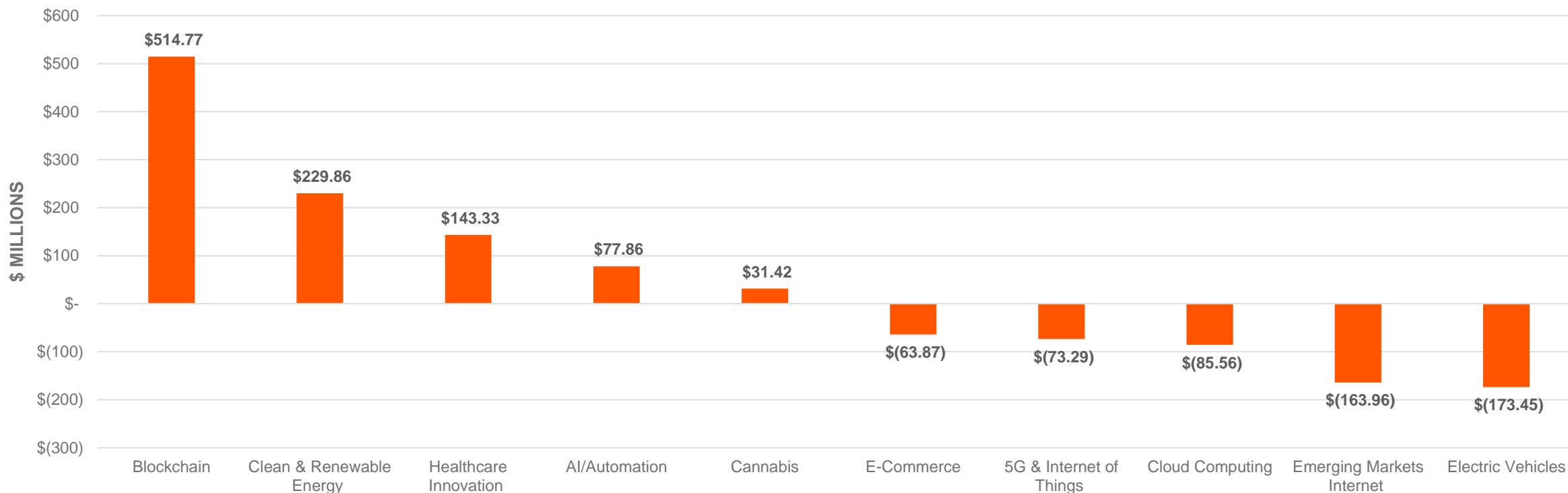
Note: AUM includes assets of funds closed until the last month of trading activity.



## Thematic ETF Landscape: AUM & Flows

In terms of net flows, Blockchain and Clean & Renewable Energy had net inflows surpassing +\$200 million, while Emerging Markets Internet and Electric Vehicles experienced net outflows exceeding -\$100 million.

Top/Bottom 5 Themes by Monthly Flows



Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: AUM includes assets of funds closed until the last month of trading activity.

## December 2023 Thematic ETFs Recap

### Top/Bottom AUM by %Δ

Ticker	Name	Dec-23	Nov-23	%Δ
WGMI	Valkyrie Bitcoin Miners ETF	\$69.73	\$25.08	178%
BLOK	Amplify Transformational Data Sharing ETF	\$1,087.47	\$510.78	113%
IBLC	iShares Blockchain and Tech ETF	\$19.02	\$10.11	88%
SPRX	Spear Alpha ETF	\$19.65	\$11.61	69%
DAPP	VanEck Vectors Digital Transformation ETF	\$95.13	\$56.81	67%
WFH	Direxion Work From Home ETF	\$28.64	\$30.72	-7%
KWEB	KraneShares CSI China Internet ETF	\$5,376.00	\$5,798.09	-7%
EMQQ	Emerging Markets Internet & Ecommerce ETF	\$400.49	\$454.86	-12%
TIME	Clockwise Capital Innovation ETF	\$15.77	\$18.02	-13%
KEMQ	KraneShares Emerging Markets Consumer Technology Index ETF	\$9.65	\$11.04	-13%

### Top/Bottom AUM by \$Δ (in millions)

Ticker	Name	Dec-23	Nov-23	\$ Δ
ARKK	ARK Innovation ETF	\$9,277.96	\$7,997.54	\$1,280
BLOK	Amplify Transformational Data Sharing ETF	\$1,087.47	\$510.78	\$577
PAVE	Global X U.S. Infrastructure Development ETF	\$5,680.37	\$5,153.80	\$527
ARKG	Genomic Revolution ETF	\$2,224.94	\$1,757.38	\$468
TAN	Invesco Solar ETF	\$1,758.19	\$1,301.81	\$456
E VX	Environmental Services ETF	\$74.71	\$78.25	-\$4
WCLD	WisdomTree Cloud Computing Fund	\$677.52	\$686.72	-\$9
LIT	Global X Lithium & Battery Tech ETF	\$2,083.10	\$2,101.83	-\$19
EMQQ	Emerging Markets Internet & Ecommerce ETF	\$400.49	\$454.86	-\$54
KWEB	KraneShares CSI China Internet ETF	\$5,376.00	\$5,798.09	-\$422

Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: Top/bottom ETFs by %Δ are limited to those that started November 2023 with AUM > \$10M and excludes fund closures.

## December 2023 Thematic ETFs Recap

### Top/Bottom MoM Flows by \$Δ (in millions)

Ticker	Name	MoM Flows (\$M)
BLOK	Amplify Transformational Data Sharing ETF	\$439.20
TAN	Invesco Solar ETF	\$222.56
ARKG	Genomic Revolution ETF	\$149.73
AIQ	Global X Artificial Intelligence & Tehnology ETF	\$82.97
ARKK	ARK Innovation ETF	\$69.47
FIVG	Defiance Next Gen Connectivity ETF	-\$31.23
EMQQ	Emerging Markets Internet & Ecommerce ETF	-\$48.32
WCLD	WisdomTree Cloud Computing Fund	-\$60.36
KWEB	KraneShares CSI China Internet ETF	-\$163.96
LIT	Global X Lithium & Battery Tech ETF	-\$164.11

Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of December 31, 2023.

Note: Top/bottom ETFs by %Δ are limited to those that started November 2023 with AUM > \$10M and excludes fund closures.

## December 2023 Thematic ETFs Launches/Closures

During the month, five thematic ETFs were launched, and four ETFs were delisted.

### Thematic ETF Launches

Ticker	Name	Issuer	Inception Date
SPAM	Themes Cybersecurity ETF	Themes ETF Trust	12/07/2023
WISE	Themes Generative Artificial Int ETF	Themes ETF Trust	12/07/2023
CLOD	Themes Cloud Computing ETF	Themes ETF Trust	12/14/2023
FINE	Themes European Luxury ETF	Themes ETF Trust	12/14/2023
EV	Mast Global Battery Recycling & Production ETF	Neos Funds	12/20/2023

### Thematic ETF Closures

Ticker	Name	Issuer	Closure Date
XDNA	Kelly CRISPR & Gene Editing Tech ETF	Kelly ETFs	12/08/2023
BYTE	Roundhill IO Digital Infrastructure ETF	Roundhill	12/13/2023
CIRC	JPMorgan Sustainable Consumption ETF	JPMorgan	12/18/2023
UPWD	JPMorgan Social Advancement ETF	JPMorgan	12/18/2023

Source: Global X ETFs, Bloomberg. as of December 31, 2023.

Thematic ETF Report



# Risk Information

## Risk Information

The Global X Thematic Classification System is based on the expertise, views, and opinions of the Global X Thematic Classification Committee and are subject to change.

Global X defines thematic investing as the process of identifying powerful disruptive macro-level trends and the underlying investments that stand to benefit from the materialization of those trends. By nature, thematic investing is a long term, growth-oriented strategy, that is typically unconstrained geographically or by traditional sector/industry classifications, has low correlation to other growth strategies, and invests in relatable concepts. Investing involves risk, including the possible loss of principal. This information is not intended to be individual or personalized investment or tax advice and should not be used for trading purposes. Please consult a financial advisor or tax professional for more information regarding your investment and/or tax situation.

The process of identifying themes consists of three inexorable principles:

- 1) There must be high conviction that the theme will materialize and have a meaningful impact on segments of the economy or markets. Often this is due to observable structural changes in technology, demographics, consumer behavior, or the physical environment, but can also be influenced by other factors.
- 2) A theme must be investable, meaning there are publicly traded companies that provide exposure to the concept. Ideally, the group of companies is broad, have high liquidity, and attribute a substantial portion of their business operations (revenues, assets, research & development) to the theme.
- 3) A theme must be expected to express itself over a medium to long-term time horizon, generally considered to be five years or longer. A longer-term time horizon makes market timing less of a factor in the success of identifying a theme.

Notably, and taking into consideration the principles above, thematic investing does not consist of ESG, values-based, or policy-driven strategies, unless they otherwise represent a disruptive structural trend (e.g. climate change). Further, funds that adhere to traditional sector or industry classifications, or that are used primarily to gain exposure to cyclical trends (e.g. currencies, valuations, inflation) are not considered thematic. Finally, alternative asset classes, such as listed infrastructure, MLPs, and ubiquitous commodities are not considered thematic. We recognize that these exclusions may differ from other third-party definitions of thematic investing, but it is consistent with, and core to, Global X's thematic classification system and process.

Based on the definition and principles of thematic investing above, Global X has established a thematic classification system that seeks to identify powerful themes and organize them by common traits and drivers. The system consists of four layers of classifications: 1) Categories; 2) Mega-Themes; 3) Themes; and 4) Sub-Themes, with each layer becoming sequentially narrower in its focus.

'Categories' is the broadest layer and represents three fundamental drivers of disruption: exponential advancements in technology (Disruptive Technology), changing consumer habits and demographics (People & Demographics), and the evolving physical landscape (Physical Environment). One layer down are 'Mega-Themes,' which serve as a foundation to multiple transformative forces that are causing substantial changes in a common area. Conceptually, Mega-Themes are a collection of more narrowly targeted Themes. For example, Big Data is a Mega-Theme that consists of Machine/Deep Learning, Cybersecurity, Quantum Computing, and Cloud/Edge Computing. Further down, we identify 'Themes' as the specific areas of transformational disruption that are driving technology forward, changing consumer demands, or impacting the environment. 'Sub-Themes' are more niche areas, such as specific applications of themes or upstream forces that are driving themes forward.

The number and categories, mega-themes, themes, and sub-themes is expected to evolve over time as new drivers of structural changes emerge or fade. Such decisions will be made by the Global X Thematic Classification Committee ("the committee") and take into account internal and external research and data about potential themes.

## Risk Information

The ETF industry consists of many funds seeking to provide exposure to categories, mega-themes, themes, or sub-themes identified within the thematic classification system. The Global X Thematic Classification Committee first evaluates the entire universe of US-listed ETFs to identify which qualify as thematic ETFs, based on Global X's definition of thematic investing and the stated objectives, methodology, and holdings of each ETF. Next, the committee identifies the best fit for each thematic ETF within the classification system, by further analyzing a fund's methodology, holdings, and stated objectives. When a new ETF launches or an existing ETF changes its strategy, its classification is evaluated promptly by the committee, and any changes are published in the next monthly Thematic ETF Report.

While occasionally an ETF may engage in multiple mega-themes, themes, or sub-themes, its classification is determined based on the definition that most closely describes the true nature of the ETF.

While an ETF may be classified within a certain category, mega-theme, theme, or sub-theme, Global X does not give any assurances that the ETF provides good and accurate exposure to the specific theme it is targeting. For example, an ETF may target a particular theme, but have very broad exposure, including firms that have low relevance or economic exposure to the specified theme.

The thematic classification system is reviewed monthly by the Global X Thematic Classification committee to consider new potential categories, mega-themes, themes, or sub-themes. Changes in the classification will be announced at the time of release of the following monthly Thematic ETF Report.

As a new ETF launches or changes its strategy, its classification is evaluated promptly by the committee, and published at the time of release of the Thematic ETF Report. In the case of change in an ETF strategy/methodology, holdings, or stated objectives, the thematic classification system will promptly incorporate or drop the ETF in regards into its respective classification, maintaining the history of assets under management (AUM) of the Fund.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. The completeness of the Global X Thematic ETF Report is done on a best efforts basis at the point in time with the data available to Global X as of the time of its publication. The inclusion of a Fund in this framework reflects the view of Global X alone. Global X makes no guarantee that this framework is complete nor inclusive of all ETFs in their view of their respective issuer.

***Global X accepts requests for reviews or appeals for any ETFs. Please contact Global X at [research@globalxetfs.com](mailto:research@globalxetfs.com), and the appeal will be considered in a timely manner. There are no guarantees that an appeal will result in a change in the ETF's classification.***

The Thematic ETF Report, including its thematic classification system, fall under the supervision of the Global X Thematic Classification committee. This committee consists of members from Global X's research and product teams who have extensive knowledge and familiarity with thematic investing and the ETF industry. The objective of the committee is to ensure, in a best efforts basis, a definition, classification, and identification of the universe of thematic ETFs. The committee meets at least monthly to review the classification system, as well as on an ad-hoc basis to review new ETF launches or ETFs that change their strategy.

## Risk Information

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Thematic ETF Report



# Appendix

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
MRAD	Advertising and Marketing Technology ETF	\$1.23	\$1.15	\$0.00	Disruptive Technology	Big Data	Cloud Computing	MarTech
WFH	Direxion Work From Home ETF	\$28.64	\$30.72	-\$4.10	Disruptive Technology	Big Data	Cloud Computing	Remote Work
SKYY	First Trust Cloud Computing ETF	\$2,897.30	\$2,719.16	-\$12.48	Disruptive Technology	Big Data	Cloud Computing	
WCLD	WisdomTree Cloud Computing Fund	\$677.52	\$686.72	-\$60.36	Disruptive Technology	Big Data	Cloud Computing	
CLOU	Global X Cloud Computing ETF	\$617.86	\$581.16	-\$14.74	Disruptive Technology	Big Data	Cloud Computing	
IWFH	iShares Virtual Work and Life Multisector ETF	\$3.11	\$3.05	\$0.00	Disruptive Technology	Big Data	Cloud Computing	
FCLD	Fidelity Cloud Computing ETF	\$55.24	\$47.99	\$5.62	Disruptive Technology	Big Data	Cloud Computing	
IVES	Wedbush ETFMG Global Cloud Technology ETF	\$24.74	\$22.50	\$0.00	Disruptive Technology	Big Data	Cloud Computing	
CLOD	Themes Cloud Computing ETF	\$0.51	\$0.00	\$0.50	Disruptive Technology	Big Data	Cloud Computing	
BUG	Global X Cybersecurity ETF	\$708.19	\$647.55	\$3.32	Disruptive Technology	Big Data	Cybersecurity	
HACK	ETFMG Prime Cyber Security ETF	\$1,647.23	\$1,556.08	-\$8.69	Disruptive Technology	Big Data	Cybersecurity	
IHAK	iShares Cybersecurity and Tech ETF	\$739.23	\$679.47	\$2.26	Disruptive Technology	Big Data	Cybersecurity	
CIBR	First Trust NASDAQ Cybersecurity ETF	\$5,900.85	\$5,451.76	\$21.20	Disruptive Technology	Big Data	Cybersecurity	
WCBR	WisdomTree Cybersecurity ETF	\$49.45	\$37.55	\$7.57	Disruptive Technology	Big Data	Cybersecurity	
FITE	SPDR Kensho Future Security ETF	\$40.24	\$37.36	\$0.55	Disruptive Technology	Big Data	Cybersecurity	
PSWD	Xtrackers Cybersecurity Select Equity ETF	\$6.02	\$5.54	\$0.00	Disruptive Technology	Big Data	Cybersecurity	
SPAM	Themes Cybersecurity ETF	\$0.53	\$0.00	\$0.50	Disruptive Technology	Big Data	Cybersecurity	
WTAI	WisdomTree Artifcl Intlgn & Innvtn ETF	\$199.40	\$171.50	\$13.35	Disruptive Technology	Big Data	Machine/Deep Learning	
QTUM	Defiance Quantum ETF	\$203.74	\$184.26	\$5.47	Disruptive Technology	Big Data	Quantum Computing	
AIQ	Global X Artificial Intelligence & Tehnology ETF	\$899.68	\$781.26	\$82.97	Disruptive Technology	Big Data		
THNQ	ROBO Global® Artificial Intelligence ETF	\$127.68	\$110.12	\$8.97	Disruptive Technology	Big Data		
XDAT	Franklin Exponential Data ETF	\$4.36	\$4.16	\$0.00	Disruptive Technology	Big Data		
DAT	ProShares Big Data Refineres ETF	\$4.10	\$3.83	\$0.00	Disruptive Technology	Big Data		
TRFK	Pacer Data and Digital Revolution ETF	\$6.59	\$5.40	\$0.74	Disruptive Technology	Big Data		
CHAT	Roundhill Generative AI & Technology ETF	\$64.17	\$61.43	-\$0.01	Disruptive Technology	Big Data		
IGPT	Invesco AI and Next gen Software ETF	\$184.46	\$175.95	-\$4.15	Disruptive Technology	Big Data		
WISE	Themes Generative Artificial Int ETF	\$2.99	\$0.00	\$2.96	Disruptive Technology	Big Data		
WBAT	WisdomTree Battery Val Chn & Innvt ETF	\$4.57	\$4.49	\$0.00	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries
ZSB	USCF Sustainable Battery Metals Stgy Fd	\$1.65	\$1.69	\$0.00	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries
BATT	Amplify Advanced Battery Metals and Materials ETF	\$110.32	\$113.70	-\$6.89	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
LITP	Sprott Lithium Miners ETF	\$4.67	\$4.18	\$0.12	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries
LIT	Global X Lithium & Battery Tech ETF	\$2,083.10	\$2,101.83	-\$164.11	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries
ILIT	iShares Lithium Miners And Producers ETF	\$3.40	\$3.09	\$0.00	Disruptive Technology	Mobility	Electric Vehicles	Lithium/Batteries
FDRV	Fidelity Electric Vehicles and Future Transportation ETF	\$47.17	\$45.93	-\$2.56	Disruptive Technology	Mobility	Electric Vehicles	
EVXX	Defiance Pure Electric Vehicle ETF	\$2.36	\$2.13	\$0.00	Disruptive Technology	Mobility	Electric Vehicles	
DRIV	Global X Autonomous & Electric Vehicles ETF	\$713.31	\$697.74	-\$30.26	Disruptive Technology	Mobility		
CLNR	IQ Cleaner Transport	\$5.69	\$5.93	-\$0.55	Disruptive Technology	Mobility		
MOTO	The SmartETFs Smart Transportation & Technology ETF	\$11.51	\$10.94	\$0.00	Disruptive Technology	Mobility		
KARS	KraneShares Electric Vehicles and Future Mobility Index ETF	\$142.56	\$140.67	-\$4.93	Disruptive Technology	Mobility		
VCAR	Simplify Volt RoboCar Disruption ETF	\$4.80	\$4.29	\$0.22	Disruptive Technology	Mobility		
HAIL	SPDR Kensho Smart Mobility ETF	\$44.09	\$42.55	-\$2.14	Disruptive Technology	Mobility		
IDRV	iShares Self-Driving EV and Tech ETF	\$355.71	\$335.62	-\$3.43	Disruptive Technology	Mobility		
EV	Mast Global Battery Recycling & Production ETF	\$3.35	\$0.00	\$3.36	Disruptive Technology	Mobility		
SOCL	Global X Social Media ETF	\$163.16	\$159.19	\$0.00	Disruptive Technology	Digital Experiences	Social Media	
OND	ProShares On-Demand ETF	\$0.62	\$0.61	\$0.00	Disruptive Technology	Digital Experiences	Streaming	
HERO	Global X Video Games & Esports ETF	\$134.52	\$132.34	-\$3.79	Disruptive Technology	Digital Experiences	Video Games	Esports
ESPO	Video Gaming and eSports ETF	\$255.98	\$248.89	\$0.00	Disruptive Technology	Digital Experiences	Video Games	Esports
NERD	Roundhill BITKRAFT Esports & Digital Entertainment ETF	\$20.84	\$21.49	-\$1.54	Disruptive Technology	Digital Experiences	Video Games	Esports
BNGE	First Trust S-Network Strmg & Gmng ETF	\$4.71	\$4.55	\$0.00	Disruptive Technology	Digital Experiences	Video Games	
GAMR	ETFMG Video Game Tech ETF	\$44.67	\$42.55	\$0.00	Disruptive Technology	Digital Experiences	Video Games	
GGME	Invesco Next Gen Media and Gaming ETF	\$33.72	\$32.12	\$0.00	Disruptive Technology	Digital Experiences		
METV	Roundhill Ball Metaverse ETF	\$463.55	\$432.28	-\$3.97	Disruptive Technology	Digital Experiences		
IVRS	iShares Future Metaverse Tec And Com ETF	\$6.51	\$6.20	-\$0.01	Disruptive Technology	Digital Experiences		
FMET	Fidelity Metaverse ETF	\$23.81	\$22.79	\$0.00	Disruptive Technology	Digital Experiences		
ARVR	First Trust Indxx Metaverse ETF	\$1.74	\$1.65	\$0.00	Disruptive Technology	Digital Experiences		
VR	Global X Metaverse ETF	\$2.61	\$2.74	-\$0.25	Disruptive Technology	Digital Experiences		
ODDS	Pacer BlueStar Digital Entertainment ETF	\$0.81	\$0.77	\$0.00	Disruptive Technology	Digital Experiences		
VERS	ProShares Metaverse ETF	\$7.19	\$6.52	\$0.00	Disruptive Technology	Digital Experiences		
BKCH	Global X Blockchain ETF	\$142.38	\$87.12	\$12.53	Disruptive Technology	FinTech	Blockchain	
SATO	Invesco Alerian Galaxy Crypto Economy ETF	\$8.44	\$5.28	\$0.74	Disruptive Technology	FinTech	Blockchain	

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
BLKC	Invesco Alerian Galaxy Blockchain Users and Decentralized Commerce ETF	\$3.65	\$2.98	\$0.00	Disruptive Technology	FinTech	Blockchain	
DAPP	VanEck Vectors Digital Transformation ETF	\$95.13	\$56.81	\$9.80	Disruptive Technology	FinTech	Blockchain	
BITQ	Bitwise Crypto Industry Innovators ETF	\$143.41	\$99.67	\$4.00	Disruptive Technology	FinTech	Blockchain	
KOIN	Innovation Shares NextGen Protocol ETF	\$13.23	\$12.92	\$0.00	Disruptive Technology	FinTech	Blockchain	
BLOK	Amplify Transformational Data Sharing ETF	\$1,087.47	\$510.78	\$439.20	Disruptive Technology	FinTech	Blockchain	
LEGR	First Trust Indxx Innovative Transaction & Process ETF	\$104.24	\$99.25	\$0.00	Disruptive Technology	FinTech	Blockchain	
BLCN	Realty Shares Nasdaq NexGen Economy ETF	\$74.80	\$65.81	\$0.00	Disruptive Technology	FinTech	Blockchain	
WGMI	Valkyrie Bitcoin Miners ETF	\$69.73	\$25.08	\$28.81	Disruptive Technology	FinTech	Blockchain	
CRPT	First Trust SkyBridge Crypto Industry and Digital Economy ETF	\$35.81	\$24.43	\$1.82	Disruptive Technology	FinTech	Blockchain	
FDIG	Fidelity Crypto Industry & Digital Payments ETF	\$80.84	\$53.86	\$10.99	Disruptive Technology	FinTech	Blockchain	
IBLC	iShares Blockchain and Tech ETF	\$19.02	\$10.11	\$4.25	Disruptive Technology	FinTech	Blockchain	
STCE	Schwab Crypto Thematic ETF	\$20.63	\$15.34	\$1.46	Disruptive Technology	FinTech	Blockchain	
BCDF	Horizon Kinetics Blockchain Dev ETF	\$6.73	\$5.11	\$1.19	Disruptive Technology	FinTech	Blockchain	
BWEB	Bitwise Web3 ETF	\$1.04	\$0.88	-\$0.01	Disruptive Technology	FinTech	Blockchain	
IPAY	ETFMG Prime Mobile Payments ETF	\$372.30	\$342.12	-\$2.60	Disruptive Technology	FinTech	Mobile Payments	
GFOF	Grayscale Future of Finance ETF	\$7.64	\$5.64	\$0.04	Disruptive Technology	FinTech		
FINX	Global X FinTech ETF	\$403.00	\$351.48	\$1.69	Disruptive Technology	FinTech		
ARKF	Fintech Innovation ETF	\$1,164.06	\$975.05	\$22.39	Disruptive Technology	FinTech		
EMFQ	Amplify Emerging Market FinTech ETF	\$2.12	\$2.15	\$0.00	Disruptive Technology	FinTech		
BPAY	BlackRock Future Financial and Tech ETF	\$4.56	\$4.20	\$0.00	Disruptive Technology	FinTech		
FDFE	Fidelity® Disruptive Finance ETF	\$42.08	\$42.23	-\$2.91	Disruptive Technology	FinTech		
VPN	Global X Data Center REITs & Digital Infrastructure ETF	\$50.57	\$39.32	\$10.16	Disruptive Technology	Connectivity	Digital Infrastructure	
SRVR	Pacer Benchmark Data & Infrastructure Real Estate SCTR ETF	\$526.84	\$503.29	\$2.91	Disruptive Technology	Connectivity	Digital Infrastructure	
GREI	Goldman Sachs FT RL Estt & Infrs Eq ETF	\$24.01	\$23.01	\$0.00	Disruptive Technology	Connectivity	Digital Infrastructure	
WTRE	WisdomTree New Economy Real Estate Fund ETF	\$22.07	\$20.82	\$0.00	Disruptive Technology	Connectivity	Digital Infrastructure	
KFVG	KraneShares CICC China 5G and Technology Leaders Index ETF	\$11.18	\$11.05	\$0.00	Disruptive Technology	Connectivity	5G & Internet of Things	
GRID	First Trust Nasdaq Clean Edge Smart GRID Infrastructure Index	\$816.40	\$759.67	-\$19.50	Disruptive Technology	Connectivity	5G & Internet of Things	Smart Cities
SIMS	SPDR Kensho Intelligent Structure ETF	\$19.38	\$20.39	-\$2.04	Disruptive Technology	Connectivity	5G & Internet of Things	Smart Cities
FIVG	Defiance Next Gen Connectivity ETF	\$575.61	\$559.91	-\$31.23	Disruptive Technology	Connectivity	5G & Internet of Things	
NXTG	First Trust Indxx NextG ETF	\$403.91	\$395.25	-\$11.30	Disruptive Technology	Connectivity	5G & Internet of Things	

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
WUGI	Esoterica NextG Economy ETF	\$23.18	\$23.05	-\$1.28	Disruptive Technology	Connectivity	5G & Internet of Things	
SNSR	Global X Internet of Things ETF	\$305.49	\$287.49	-\$7.94	Disruptive Technology	Connectivity	5G & Internet of Things	
KNCT	Invesco Next Gen Connectivity ETF	\$42.08	\$39.90	\$0.00	Disruptive Technology	Connectivity	5G & Internet of Things	
KWEB	KraneShares CSI China Internet ETF	\$5,376.00	\$5,798.09	-\$163.96	Disruptive Technology	Connectivity	Emerging Markets Internet	
ROKT	SPDR Kensho Final Frontiers ETF	\$17.44	\$16.97	-\$0.43	Disruptive Technology	Connectivity	Space/Satellite Communications	
UFO	Procure Space ETF	\$40.60	\$35.79	\$0.00	Disruptive Technology	Connectivity	Space/Satellite Communications	
ARKX	Ark Space Exploration	\$272.88	\$260.74	-\$7.55	Disruptive Technology	Connectivity	Space/Satellite Communications	
PNQI	Invesco NASDAQ Internet ETF	\$694.28	\$625.93	\$35.28	Disruptive Technology	Connectivity		
ARKW	ARK Next Generation Internet ETF	\$1,765.66	\$1,516.72	\$33.99	Disruptive Technology	Connectivity		
XWEB	SPDR S&P Internet ETF	\$23.74	\$21.80	\$0.00	Disruptive Technology	Connectivity		
OGIG	ALPS OShares Global Internet Giants ETF	\$135.83	\$137.85	-\$8.12	Disruptive Technology	Connectivity		
FDCF	Fidelity® Disruptive Communications ETF	\$41.51	\$39.24	\$0.00	Disruptive Technology	Connectivity		
PRNT	3D Printing ETF	\$155.20	\$145.90	-\$7.95	Disruptive Technology	Robotics	3D Printing	
ARKQ	ARK Autonomous Technology & Robotics ETF	\$1,054.09	\$976.95	-\$13.95	Disruptive Technology	Robotics	AI/Automation	
BOTZ	Global X Robotics & Artificial Intelligence ETF	\$2,484.57	\$2,244.41	\$65.63	Disruptive Technology	Robotics	AI/Automation	
ROBO	ROBO Global Robotics and Automation Index ETF	\$1,398.55	\$1,293.57	-\$17.07	Disruptive Technology	Robotics	AI/Automation	
ROBT	First Trust Nasdaq Artificial Intelligence and Robotics ETF	\$491.29	\$441.86	\$13.22	Disruptive Technology	Robotics	AI/Automation	
IRBO	iShares Robotics and Artificial Intelligence ETF	\$599.74	\$536.09	\$33.94	Disruptive Technology	Robotics	AI/Automation	
IQM	Franklin Intelligent Machines ETF	\$20.44	\$21.47	-\$2.53	Disruptive Technology	Robotics	AI/Automation	
MAKX	ProShares S&P Kensho Smart Factories ETF	\$0.95	\$0.85	\$0.00	Disruptive Technology	Robotics	AI/Automation	
IBOT	VanEck Robotics ETF	\$3.97	\$2.78	\$0.99	Disruptive Technology	Robotics	AI/Automation	
FBOT	Fidelity® Disruptive Automation ETF	\$105.98	\$103.13	-\$2.37	Disruptive Technology	Robotics	AI/Automation	
BULD	Pacer BlueStar Engineering the Future ETF	\$0.89	\$0.81	\$0.00	Disruptive Technology	Robotics		
PTEC	Global X Prop Tech ETF	\$3.00	\$2.73	\$0.00	Disruptive Technology	PropTech		
SHLD	Global X Defense Tech ETF	\$4.72	\$4.87	-\$0.27	Disruptive Technology	Defense Tech		
XITK	SPDR FactSet Innovative Technology ETF	\$96.35	\$94.49	-\$5.61	Disruptive Technology			
DTEC	ALPS Disruptive Technologies ETF	\$107.96	\$98.60	\$3.05	Disruptive Technology			
LOUP	Innovator Loup Frontier Tech ETF	\$45.95	\$40.48	\$2.16	Disruptive Technology			
IZRL	ARK Israel Innovative Technology ETF	\$101.94	\$90.68	\$3.42	Disruptive Technology			
IETC	iShares Evolved U.S. Technology ETF	\$177.77	\$166.30	\$3.12	Disruptive Technology			

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
TECB	iShares US Tech Breakthrough Multisector ETF	\$334.69	\$314.16	\$2.16	Disruptive Technology			
GINN	Goldman Sachs Innovate Equity ETF	\$357.49	\$335.66	\$0.00	Broad Thematic			
MOON	Direxion Moonshot Technologies ETF	\$29.83	\$26.98	-\$1.13	Disruptive Technology			
BTEK	BlackRock Future Tech ETF	\$13.94	\$13.17	\$0.00	Disruptive Technology			
ANEW	MSCI Transformational Changes ETF	\$8.62	\$8.13	\$0.00	Broad Thematic			
TMAT	Main Thematic Innovation ETF	\$125.63	\$111.74	\$0.96	Disruptive Technology			
GGRW	Gabelli Funds' Growth Innovators ETF	\$3.17	\$3.07	\$0.00	Disruptive Technology			
IDAT	iShares Cloud 5G and Tech ETF	\$6.63	\$6.09	\$0.00	Disruptive Technology			
ILDR	First Trust Innovation Leaders ETF	\$19.68	\$18.61	\$0.00	Disruptive Technology			
MVPS	Amplify Thematic All-Stars ETF	\$3.12	\$2.83	\$0.00	Disruptive Technology			
SPRX	Spear Alpha ETF	\$19.65	\$11.61	\$6.04	Disruptive Technology			
JFWD	Jacob Forward ETF	\$3.14	\$2.44	\$0.11	Disruptive Technology			
GK	AdvisorShares Gerber Kawasaki ETF	\$18.57	\$17.53	\$0.00	Disruptive Technology			
FFND	The Future Fund Active ETF	\$9.00	\$8.40	\$0.00	Broad Thematic			
GTEK	Goldman Sachs Future Tech Leaders Equity ETF	\$169.24	\$161.83	-\$3.33	Disruptive Technology			
TINY	ProShares Nanotechnology ETF	\$3.14	\$2.87	\$0.00	Disruptive Technology			
KGRO	KraneShares China Innovation ETF	\$1.35	\$1.37	\$0.00	Disruptive Technology			
INNO	Harbor Disruptive Innovation ETF	\$31.50	\$30.27	-\$0.68	Broad Thematic			
DGIN	VanEck Digital India ETF	\$9.02	\$5.14	\$3.60	Disruptive Technology			
SAMT	Strategas Macro Thematic Opp ETF	\$64.37	\$65.57	-\$0.70	Broad Thematic			
TIME	Clockwise Capital Innovation ETF	\$15.77	\$18.02	\$0.00	Disruptive Technology			
NBDS	Neuberger Berman Disrupters ETF	\$12.05	\$10.81	\$0.63	Disruptive Technology			
TRFM	AAM Transformers ETF	\$27.68	\$25.49	\$1.45	Disruptive Technology			
MINV	Matthews Asia Innovators Active ETF	\$84.81	\$84.29	\$0.00	Disruptive Technology			
TWEB	SoFi Web 3 ETF	\$2.03	\$1.77	\$0.00	Disruptive Technology			
BKIV	BNY Mellon Innovators ETF	\$11.68	\$10.28	\$0.00	Disruptive Technology			
FDTX	Fidelity® Disruptive Technology ETF	\$107.61	\$102.68	\$0.00	Disruptive Technology			
FDIF	Fidelity® Disruptors ETF	\$90.83	\$86.79	-\$2.57	Disruptive Technology			
DYNI	IDX Dynamic Innovation ETF	\$30.13	\$22.16	\$6.22	Disruptive Technology			
CRTC	Xtrackers US National Critical Technologies ETF	\$5.34	\$5.10	\$0.00	Disruptive Technology			

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
POTX	Global X Cannabis ETF	\$30.26	\$27.99	\$0.29	People & Demographics	New Consumer	Cannabis	
YOLO	AdvisorShares Pure Cannabis ETF	\$39.30	\$38.31	-\$0.49	People & Demographics	New Consumer	Cannabis	
MJUS	ETFMG U.S. Alternative Harvest ETF	\$116.48	\$117.45	-\$2.30	People & Demographics	New Consumer	Cannabis	
MJ	ETFMG Alternative Harvest ETF	\$223.07	\$214.33	\$0.00	People & Demographics	New Consumer	Cannabis	
THCX	The Cannabis ETF	\$14.92	\$14.32	\$0.00	People & Demographics	New Consumer	Cannabis	
TOKE	Cambria Cannabis ETF	\$10.28	\$9.79	\$0.00	People & Demographics	New Consumer	Cannabis	
CNBS	Amplify Seymour Cannabis ETF	\$27.73	\$26.68	\$0.00	People & Demographics	New Consumer	Cannabis	
MSOS	AdvisorShares Pure US Cannabis ETF	\$602.53	\$555.27	\$33.92	People & Demographics	New Consumer	Cannabis	
WEED	Roundhill Cannabis ETF	\$3.16	\$3.03	\$0.00	People & Demographics	New Consumer	Cannabis	
BUYZ	Franklin Disruptive Commerce ETF	\$12.97	\$9.56	\$2.85	People & Demographics	New Consumer	E-Commerce	
IBUY	Amplify Online Retail ETF	\$191.10	\$189.28	-\$8.98	People & Demographics	New Consumer	E-Commerce	
ONLN	ProShares Online Retail ETF	\$103.53	\$99.03	-\$6.19	People & Demographics	New Consumer	E-Commerce	
EBIZ	Global X E-commerce ETF	\$74.27	\$72.76	-\$3.23	People & Demographics	New Consumer	E-Commerce	
EMQQ	Emerging Markets Internet & Ecommerce ETF	\$400.49	\$454.86	-\$48.32	People & Demographics	New Consumer	E-Commerce	
FMQQ	The Next Frontier Internet & Ecommerce ETF	\$19.67	\$19.04	\$0.00	People & Demographics	New Consumer	E-Commerce	
KEMQ	KraneShares Emerging Markets Consumer Technology Index ETF	\$9.65	\$11.04	-\$1.46	People & Demographics	New Consumer	Emerging Market Consumers	
ECON	Columbia Emerging Markets Consumer ETF	\$64.94	\$65.55	-\$1.04	People & Demographics	New Consumer	Emerging Market Consumers	
INCO	Columbia India Consumer ETF	\$146.53	\$140.33	\$2.80	People & Demographics	New Consumer	Emerging Market Consumers	
INQQ	India Internet & Ecommerce ETF	\$13.09	\$9.91	\$2.52	People & Demographics	New Consumer	Emerging Market Consumers	
MILN	Global X Millennials Thematic ETF	\$112.80	\$105.49	-\$1.06	People & Demographics	New Consumer	Millennials & Gen Z	
NBCC	Neuberger Brmn Nxt Gnrtn Cnctd Cnsm ETF	\$5.63	\$5.34	\$0.00	People & Demographics	New Consumer	Millennials & Gen Z	
KPOP	KPOP and Korean Entertainment ETF	\$3.29	\$3.06	\$0.00	People & Demographics	New Consumer	Millennials & Gen Z	
LUXX	Roundhill S&P Global Luxury ETF	\$1.26	\$1.18	\$0.00	People & Demographics	New Consumer	Millennials & Gen Z	
KLXY	KraneShares Global Luxury Index ETF	\$3.18	\$3.00	\$0.00	People & Demographics	New Consumer	Millennials & Gen Z	
FINE	Themes European Luxury ETF	\$0.49	\$0.00	\$0.49	People & Demographics	New Consumer	Millennials & Gen Z	
BYOB	SoFi Gig Economy ETF	\$7.47	\$7.53	-\$0.77	People & Demographics	New Consumer	Sharing/Gig Economy	
BETZ	Roundhill Sports Betting & iGaming ETF	\$100.52	\$99.59	-\$3.90	People & Demographics	New Consumer	Sports Betting	
GBUY	Goldman Sachs Future Consumer Equity ETF	\$80.85	\$79.13	-\$1.35	People & Demographics	New Consumer		
AWAY	ETFMG Travel Tech ETF	\$106.84	\$103.42	-\$7.45	People & Demographics	New Consumer		
LUX	Tema Luxury ETF	\$7.84	\$7.51	\$0.00	People & Demographics	New Consumer	Millennials & Gen Z	

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
AGNG	Global X Longevity Thematic ETF	\$55.30	\$53.60	-\$1.40	People & Demographics	Health	Aging Population	
HLGE	The Hartford Longevity Economy ETF	\$8.85	\$9.04	-\$0.64	People & Demographics	Health	Aging Population	
PSIL	AdvisorShares Psychedelics ETF	\$6.43	\$5.73	\$0.16	People & Demographics	Health	Healthcare Innovation	Alternative Medicine
ARKG	Genomic Revolution ETF	\$2,224.94	\$1,757.38	\$149.73	People & Demographics	Health	Healthcare Innovation	Genomics
GNOM	Global X Genomics & Biotechnology ETF	\$98.19	\$93.03	-\$5.26	People & Demographics	Health	Healthcare Innovation	Genomics
IDNA	iShares Genomics Immunology and Healthcare ETF	\$132.50	\$118.84	\$0.00	People & Demographics	Health	Healthcare Innovation	Genomics
PBE	Invesco Dynamic Biotechnology & Genome ETF	\$263.47	\$228.59	\$6.22	People & Demographics	Health	Healthcare Innovation	Genomics
HELX	Franklin Genomic Discovery ETF	\$10.67	\$11.15	-\$1.46	People & Demographics	Health	Healthcare Innovation	Genomics
CNCR	Loncar Cancer Immunotherapy ETF	\$13.93	\$11.33	\$0.00	People & Demographics	Health	Healthcare Innovation	Immunotherapy
VIRS	Pacer BioThreat ETF	\$3.23	\$3.81	-\$0.79	People & Demographics	Health	Healthcare Innovation	Public Health
EDOC	Global X Telemedicine & Digital Health ETF	\$72.33	\$64.92	-\$1.14	People & Demographics	Health	Healthcare Innovation	Telemedicine & Digital Health
FDHT	Fidelity Digital Health ETF	\$9.71	\$8.78	\$0.00	People & Demographics	Health	Healthcare Innovation	Telemedicine & Digital Health
EKG	First Trust Nasdaq Lux Digital Health Solutions ETF	\$6.37	\$5.62	\$0.00	People & Demographics	Health	Healthcare Innovation	Telemedicine & Digital Health
SYNB	Putnam Biorevolution ETF	\$8.01	\$6.14	\$2.78	People & Demographics	Health	Healthcare Innovation	
GDOC	Goldman Sachs Future Health Care EQ ETF	\$24.61	\$23.53	-\$0.80	People & Demographics	Health	Healthcare Innovation	
PINK	The Simplify Health Care ETF	\$56.07	\$50.32	\$1.28	People & Demographics	Health	Healthcare Innovation	
WDNA	WisdomTree BioRevolution ETF	\$2.70	\$2.48	\$0.00	People & Demographics	Health	Healthcare Innovation	
HART	IQ Healthy Hearts ETF	\$8.67	\$8.39	\$0.00	People & Demographics	Health	Healthcare Innovation	
CHB	Global X China Biotech Innovation ETF	\$1.87	\$2.30	-\$0.32	People & Demographics	Health	Healthcare Innovation	
GERM	ETFMG Treatments, Testing and Advancements ETF	\$12.78	\$12.35	-\$0.89	People & Demographics	Health	Healthcare Innovation	
SBIO	ALPS Medical Breakthroughs ETF	\$101.20	\$86.09	-\$2.97	People & Demographics	Health	Healthcare Innovation	
BTEC	Principal Healthcare Innovators Index ETF	\$49.10	\$42.38	-\$0.71	People & Demographics	Health	Healthcare Innovation	
HTEC	ROBO Global Healthcare Technology & Innovation	\$68.10	\$62.03	-\$1.36	People & Demographics	Health	Healthcare Innovation	
BMED	BlackRock Future Health ETF	\$3.92	\$3.58	\$0.00	People & Demographics	Health	Healthcare Innovation	
IBRN	iShares Neuroscience and Healthcare ETF	\$3.94	\$4.30	-\$1.14	People & Demographics	Health	Healthcare Innovation	
FMED	Fidelity@ Disruptive Medicine ETF	\$51.44	\$46.45	\$0.00	People & Demographics	Health	Healthcare Innovation	
BFIT	Global X Health & Wellness Thematic ETF	\$9.30	\$9.16	\$0.00	People & Demographics	Health	Health & Wellness	
CANC	Tema Oncology ETF	\$17.39	\$15.81	\$0.00	People & Demographics	Health	Health & Wellness	
HRTS	Tema Cardiovascular and Metabolic ETF	\$17.99	\$12.54	\$13.28	People & Demographics	Health	Health & Wellness	Obesity
SURI	Simplify Propel Opportunities ETF	\$92.55	\$87.80	\$0.00	People & Demographics	Health		

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.



## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
HYDR	Global X Hydrogen ETF	\$38.44	\$35.77	\$0.75	Physical Environment	Climate Change	Clean & Renewable Energy	Hydrogen
HJEN	Direxion Hydrogen ETF	\$29.09	\$28.27	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	Hydrogen
HDRO	Defiance Next Gen H2 ETF	\$25.88	\$24.97	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	Hydrogen
RAYS	Global X Solar ETF	\$7.12	\$5.98	\$0.38	Physical Environment	Climate Change	Clean & Renewable Energy	Solar
TAN	Invesco Solar ETF	\$1,758.19	\$1,301.81	\$222.56	Physical Environment	Climate Change	Clean & Renewable Energy	Solar
WNDY	Global X Wind Energy ETF	\$2.89	\$2.71	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	Wind
FAN	First Trust ISE Global Wind Energy Index Fund	\$218.48	\$201.34	-\$1.43	Physical Environment	Climate Change	Clean & Renewable Energy	Wind
ICLN	iShares Global Clean Energy ETF	\$3,073.31	\$2,772.82	\$29.48	Physical Environment	Climate Change	Clean & Renewable Energy	
RNRG	Global X Renewable Energy Producers ETF	\$49.35	\$47.17	-\$1.85	Physical Environment	Climate Change	Clean & Renewable Energy	
VCLN	Virtus Duff & Phelps Clean Energy ETF	\$7.31	\$6.87	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
FRNW	Fidelity Clean Energy ETF	\$31.06	\$28.31	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
BNE	Blue Horizon New Energy Economy ETF	\$5.22	\$4.83	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
CNRG	SPDR Kensho Clean Power ETF	\$259.68	\$241.29	\$1.42	Physical Environment	Climate Change	Clean & Renewable Energy	
PBW	Invesco WilderHill Clean Energy ETF	\$474.65	\$440.87	-\$13.11	Physical Environment	Climate Change	Clean & Renewable Energy	
SMOG	VanEck Vectors Global Alternative Energy ETF	\$164.37	\$154.49	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
ACES	ALPS Clean Energy ETF	\$297.82	\$280.10	-\$8.34	Physical Environment	Climate Change	Clean & Renewable Energy	
RNWZ	TrueShares Eagle Gbl Rnwbls Engy IncETF	\$2.51	\$2.36	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
PWER	Macquarie Energy Transition ETF	\$5.60	\$5.15	\$0.00	Physical Environment	Climate Change	Clean & Renewable Energy	
CTEC	Global X CleanTech ETF	\$62.48	\$58.87	-\$2.07	Physical Environment	Climate Change	CleanTech	
QCLN	First Trust Nasdaq Clean Edge Green Energy ETF	\$1,139.15	\$998.71	-\$14.56	Physical Environment	Climate Change	CleanTech	
ERTH	Invesco Cleantech ETF	\$232.29	\$220.71	-\$8.82	Physical Environment	Climate Change	CleanTech	
CTEX	ProShares S&P Kensho Cleantech ETF	\$5.42	\$4.56	\$0.00	Physical Environment	Climate Change	CleanTech	
SOLR	Sustainable Energy II ETF	\$5.07	\$4.63	\$0.00	Physical Environment	Climate Change	CleanTech	
GBLD	Invesco MSCI Green Building ETF	\$6.12	\$5.74	\$0.00	Physical Environment	Climate Change	Green Building	
GRNR	Global X Green Building ETF	\$2.35	\$2.17	\$0.00	Physical Environment	Climate Change	Green Building	
KROP	Global X AgTech & Food Innovation ETF	\$4.71	\$4.48	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Sustainable Food
YUMY	VanEck Future of Food ETF	\$3.25	\$3.16	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Sustainable Food
EATV	VegTech Plant-based Innovt & Clmt ETF	\$5.55	\$5.02	\$0.24	Physical Environment	Climate Change	Resource Scarcity	Sustainable Food
IVEG	iShares Emergent Food and AgTech Mult ETF	\$4.86	\$5.52	-\$0.92	Physical Environment	Climate Change	Resource Scarcity	Sustainable Food
EVX	Environmental Services ETF	\$74.71	\$78.25	-\$7.68	Physical Environment	Climate Change	Resource Scarcity	Waste/Recycling

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
AQWA	Global X Clean Water ETF	\$9.96	\$9.39	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Water
EBLU	Ecofin Global Water ESG Fund	\$50.39	\$47.41	\$0.01	Physical Environment	Climate Change	Resource Scarcity	Water
PHO	Invesco Water Resources ETF	\$1,952.82	\$1,831.42	-\$15.44	Physical Environment	Climate Change	Resource Scarcity	Water
CGW	Invesco S&P Global Water Index ETF	\$957.28	\$922.35	-\$8.23	Physical Environment	Climate Change	Resource Scarcity	Water
FIW	First Trust Water ETF	\$1,517.23	\$1,412.78	-\$4.17	Physical Environment	Climate Change	Resource Scarcity	Water
PIO	Invesco Global Water ETF	\$281.82	\$264.76	-\$3.71	Physical Environment	Climate Change	Resource Scarcity	Water
IWTR	iShares MSCI Water Management Multisector ETF	\$5.76	\$5.56	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Water
KSEA	KraneShares Rockefeller Ocean Engagement ETF	\$2.62	\$2.45	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Water
OCEN	IQ Clean Oceans ETF	\$5.04	\$4.73	\$0.00	Physical Environment	Climate Change	Resource Scarcity	Water
CCSO	Carbon Collective Climate Solutions U.S. Equity ETF	\$22.95	\$20.14	\$0.98	Physical Environment	Climate Change		
ETEC	iShares Breakthrough Environmental Solutions ETF	\$3.74	\$3.56	\$0.00	Physical Environment	Climate Change		
NVIR	Horizon Kinetics Energy Remediation ETF	\$3.24	\$3.28	\$0.00	Physical Environment	Climate Change		
GCLN	Goldman Sachs Bloomberg Cln Enrgy Eq ETF	\$11.95	\$11.57	\$0.00	Physical Environment	Climate Change		
KGRN	KraneShares MSCI China Environment ETF	\$66.91	\$68.65	-\$2.17	Physical Environment	Climate Change		
GSFP	Goldman Sachs Future Planet Equity ETF	\$45.00	\$45.33	-\$2.23	Physical Environment	Climate Change		
BECO	BlackRock Future Climate and Sustainable Economy ETF	\$4.23	\$4.02	\$0.00	Physical Environment	Climate Change		
ENRG	SoFi Smart Energy ETF	\$1.88	\$1.66	\$0.00	Physical Environment	Climate Change		
TEMP	JPMorgan Climate Change Solutions ETF	\$22.42	\$20.87	\$0.00	Physical Environment	Climate Change		
NBCT	Neuberger Berman Crbn Trnstm & Infrs ETF	\$26.73	\$25.70	\$0.00	Physical Environment	Climate Change		
RNEW	VanEck Green Infrastructure ETF	\$1.86	\$1.72	-\$0.02	Physical Environment	Climate Change		
CLIA	Veridien Climate Action ETF	\$25.08	\$21.99	\$0.51	Physical Environment	Climate Change		
UPGR	Xtrackers US Green Infrastructure Select Equity ETF	\$4.79	\$4.26	\$0.00	Physical Environment	Climate Change		
DMAT	Global X Disruptive Materials ETF	\$7.13	\$6.54	-\$1.14	Physical Environment	Disruptive Materials		
REMX	VanEck Vectors Rare Earth/Strategic Metals ETF	\$409.38	\$380.14	-\$2.95	Physical Environment	Disruptive Materials		
GMET	VanEck Green Metals ETF	\$26.75	\$24.85	\$0.00	Physical Environment	Disruptive Materials		
TINT	ProShares Smart Materials ETF	\$1.71	\$1.56	\$0.00	Physical Environment	Disruptive Materials		
CRIT	Optica Rare Earths & Critical Materials ETF	\$2.25	\$2.07	\$0.00	Physical Environment	Disruptive Materials		
ION	ProShares S&P Global Cor Btty Mtls ETF	\$2.41	\$2.18	\$0.00	Physical Environment	Disruptive Materials		
SETM	Sprott Energy Transition Materials ETF	\$13.43	\$12.64	\$0.35	Physical Environment	Disruptive Materials		
NIKL	Sprott Nickel Miners ETF	\$1.54	\$1.38	\$0.43	Physical Environment	Disruptive Materials		

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

## Appendix – Classification of Thematic ETFs

Ticker	Name	Dec 2023 (\$M)	Nov 2023 (\$M)	MoM Flows (\$M)	Category	Mega-Theme	Theme	Sub-Theme
PAVE	Global X U.S. Infrastructure Development ETF	\$5,680.37	\$5,153.80	\$22.72	Physical Environment	Infrastructure Development		
IFRA	iShares U.S. Infrastructure ETF	\$2,262.56	\$2,128.77	-\$10.75	Physical Environment	Infrastructure Development		
AIRR	First Trust RBA American Industrial Renaissance ETF	\$647.55	\$529.36	\$46.32	Physical Environment	Infrastructure Development		
OBOR	KraneShares MSCI One Belt One Road ETF	\$4.07	\$4.11	\$0.00	Physical Environment	Infrastructure Development		
SUPL	ProShares Supply Chain Logistics ETF	\$2.03	\$1.90	\$0.00	Physical Environment	Infrastructure Development		
SHPP	Pacer Industrial and Logistics ETF	\$1.08	\$1.02	\$0.00	Physical Environment	Infrastructure Development		
RBLD	First Trust Alerian US NextGen Infrastructure ETF	\$8.54	\$8.12	\$0.00	Physical Environment	Infrastructure Development		
EFRA	iShares Environmental Infrs & IndstrETF	\$4.66	\$4.39	\$0.00	Physical Environment	Infrastructure Development		
RSHO	Tema American Reshoring ETF	\$11.46	\$10.46	\$0.00	Physical Environment	Infrastructure Development		
NRSH	North America Nearshoring Stock Selection ETF	\$8.80	\$1.01	\$8.25	Physical Environment	Infrastructure Development		
BLLD	JPMorgan Sustainable Infrastructure ETF	\$25.68	\$24.70	\$0.00	Physical Environment			
ARKK	ARK Innovation ETF	\$9,277.96	\$7,997.54	\$69.47	Broad Thematic			
KOMP	SPDR Kensho New Economies Composite ETF	\$1,908.54	\$1,764.89	-\$11.26	Broad Thematic			
BTHM	Blackrock Future US Themes ETF	\$5.12	\$4.93	\$0.00	Broad Thematic			
GXTG	Global X Thematic Growth ETF	\$31.87	\$32.27	-\$2.68	Broad Thematic			
FWD	AB Disruptors ETF	\$202.36	\$178.39	\$9.61	Broad Thematic			
FMIL	Fidelity® New Millennium ETF	\$172.82	\$158.65	\$7.12	Broad Thematic			
XT	iShares Exponential Technologies ETF	\$3,507.63	\$3,273.87	-\$19.84	Broad Thematic			

Source: Global X ETFs, Bloomberg. December 2023 as of 12/31/2023; November 2023 as of 11/30/2023.

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