

# - Thematic ETF Report

## August 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 materialization 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

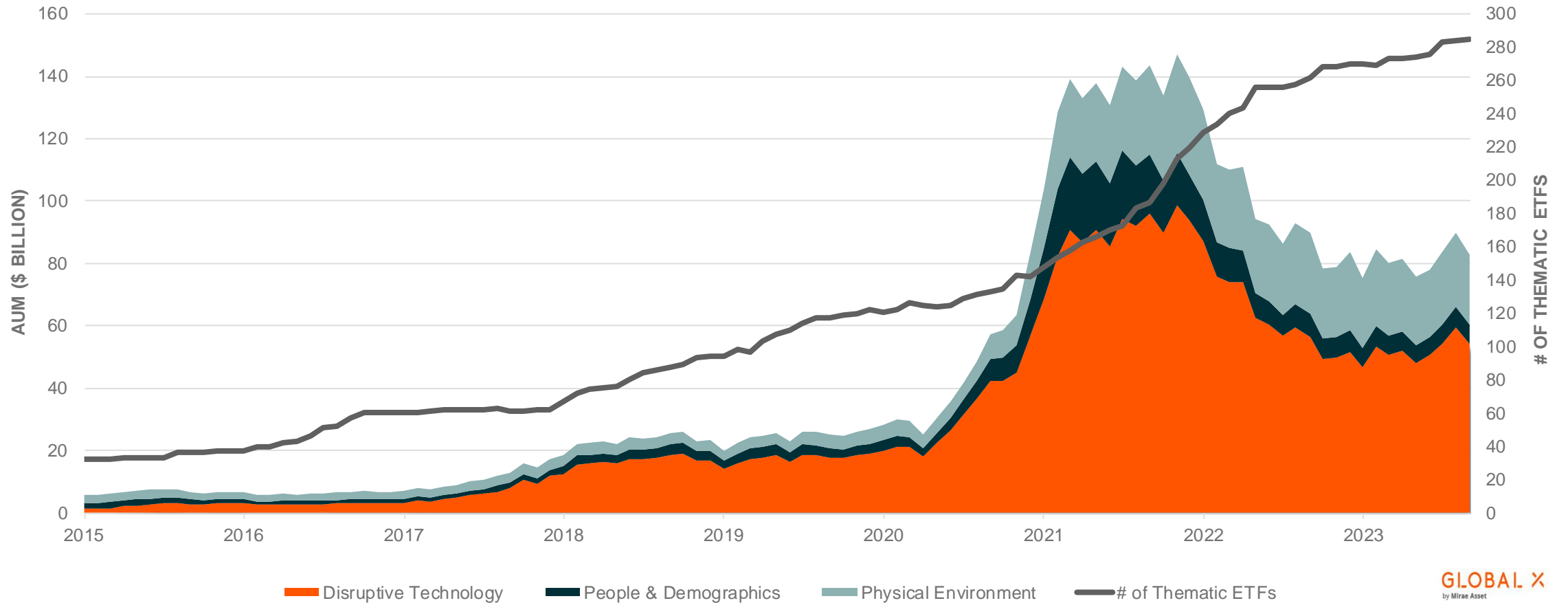
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# Defining & Categorizing Themes: Global X's Classification System

| 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      |   |  |
| <b>Robotics</b>                   | Internet of Things             | Smart Devices/ Smart Cities IoT                                       |  |
|                                   | Space/Satellite Communications |   |  |
|                                   | AI/Automation                  |   |  |
| <b>Prop-Tech</b>                  | 3D Printing                    |   |  |
|                                   | 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   |  |
|                                   | <b>Health</b>                  | Cannabis  |  |
|                                   |                                | Sports Betting  |  |
|                                   |                                | Professional Sports   |  |
|                                   |                                | Urbanization  |  |
| <b>Health</b>                     | Healthcare Innovaton           | Telemedicine & Digital Health, Genomics, Immunotherapy, Public Health |  |
|                                   | Aging Population               | Senior Care, Senior Economy   |  |
|                                   | Health & Wellness              | Obesity, Organics   |  |
|                                   | Emerging Markets Healthcare    |   |  |
|                                   | 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

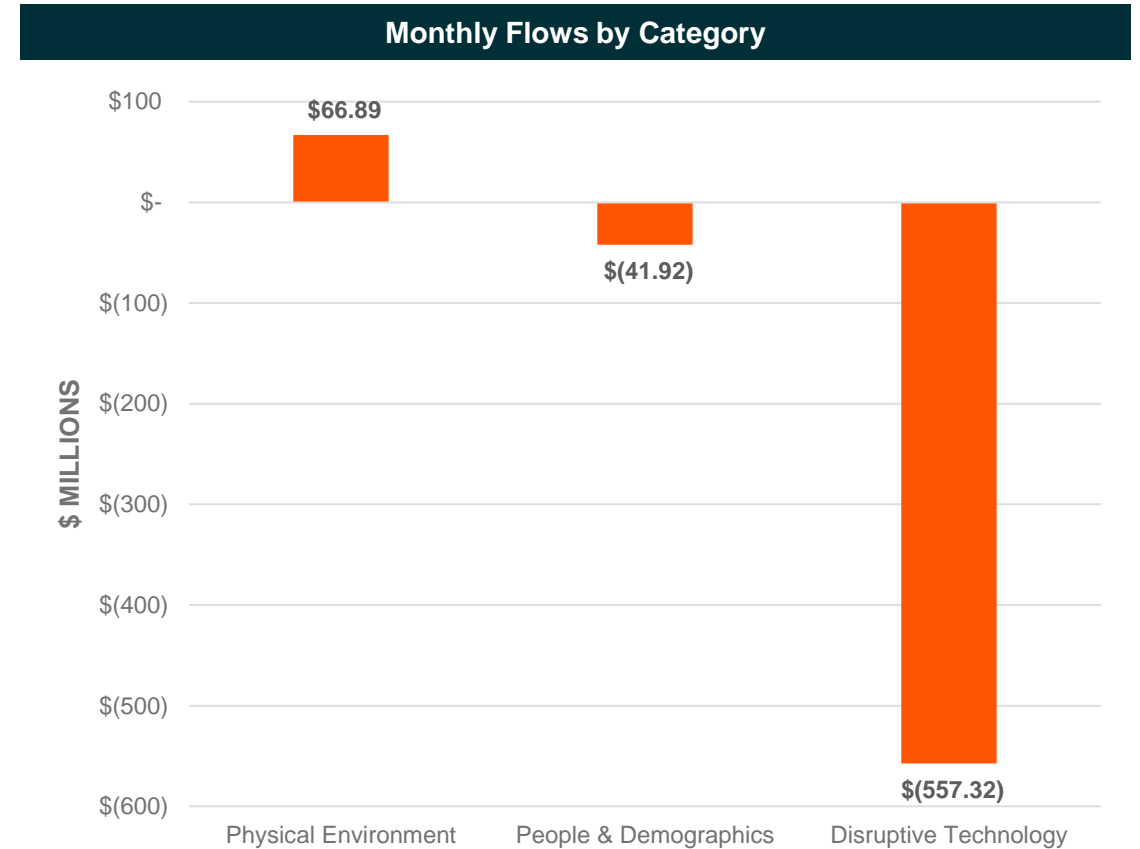
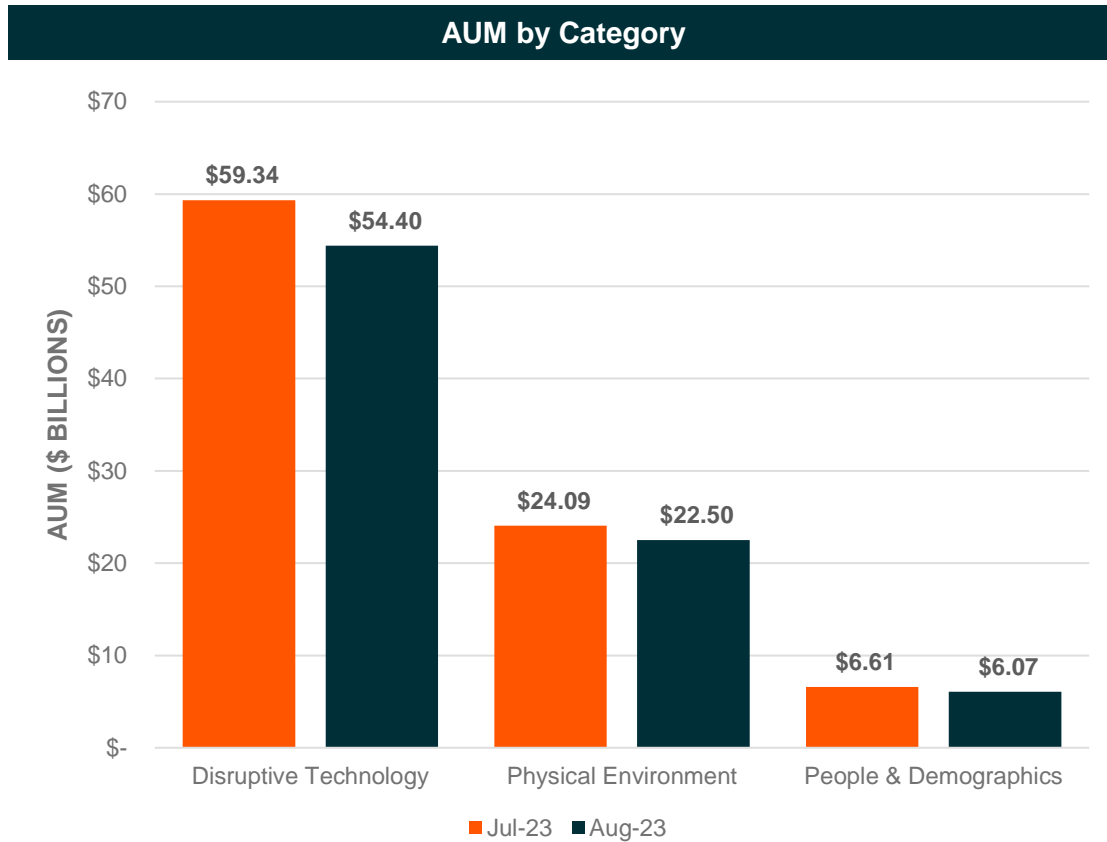
At the end of August 2023, there were 285 thematic ETFs totaling \$83.0 billion in assets under management (AUM), down -7.8% from July 2023 and down -7.5% from the same month last year.



Sources: Global X ETFs with information derived from: Bloomberg, L.P. (n.d.) [Data set]. Data as of August 31, 2023.  
 Note: AUM includes assets of funds closed until the last month of trading activity.

## Thematic ETF Landscape: AUM & Flows

In the month of August, there was a decrease in AUM across the three Categories. Physical Environment experienced inflows throughout the month, while the People & Demographics and Disruptive Technology categories showed outflows.



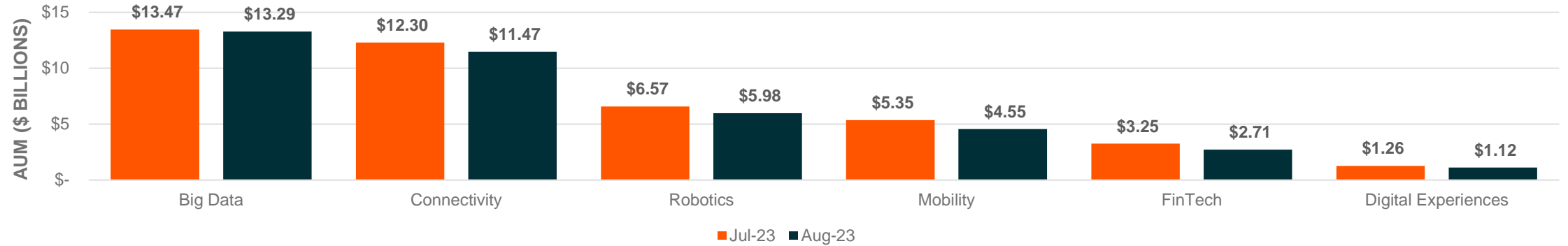
Source: Global X ETFs, Bloomberg. As of August 31, 2023.

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

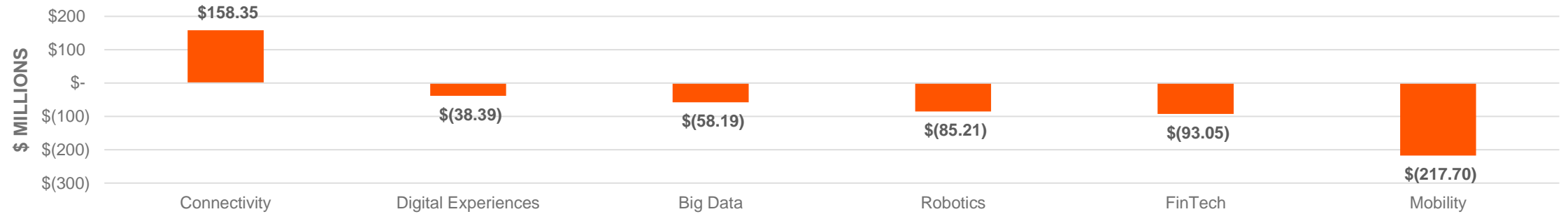
## Thematic ETF Landscape: AUM & Flows

All of the Mega-Themes related to Disruptive Technology experienced a decrease in their AUM throughout the month. Connectivity showed significant inflows in August, while the remaining Mega-Themes showed outflows.

### AUM – Disruptive Technology’s Mega-Themes



### Monthly Flows – Disruptive Technology’s Mega-Themes



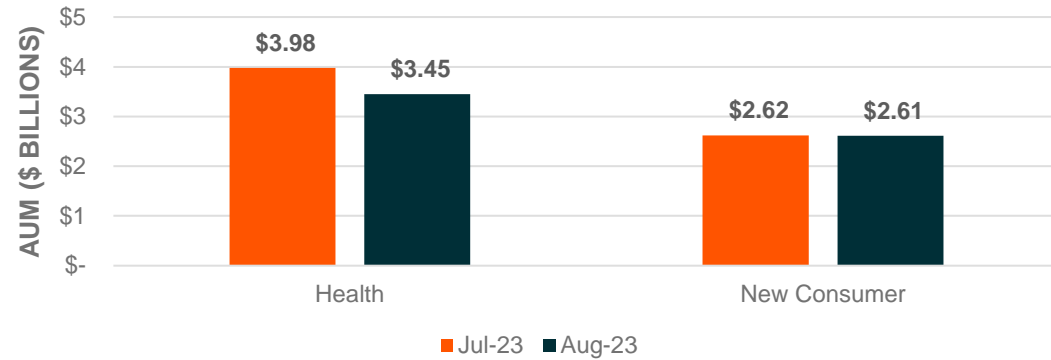
Source: Global X ETFs, Bloomberg. As of August 31, 2023.

Note: Mega-Themes may or may not add up to the Category AUM given that some ETFs considered are broad and are only classified by its Category.

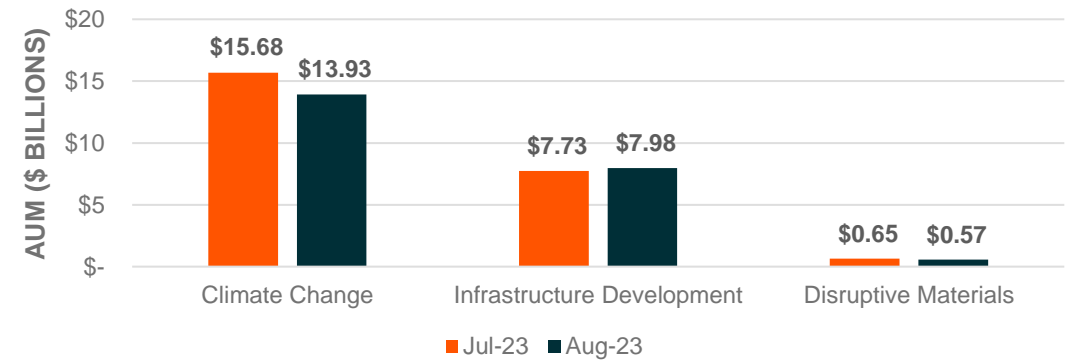
## Thematic ETF Landscape: AUM & Flows

AUM in People & Demographic Mega-Themes decreased, also indicating outflows last month. Physical Environment Mega-Themes saw AUM decrease, except for Infrastructure Development, which experienced strong inflows in August.

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



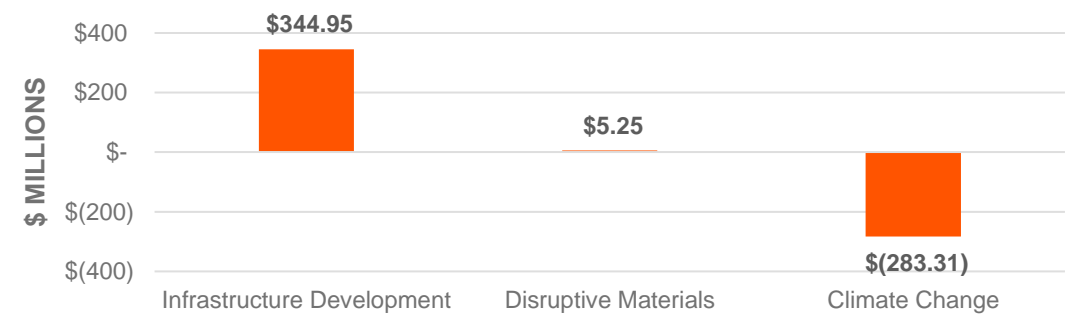
**AUM – Physical Environment's Mega-Themes**



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



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

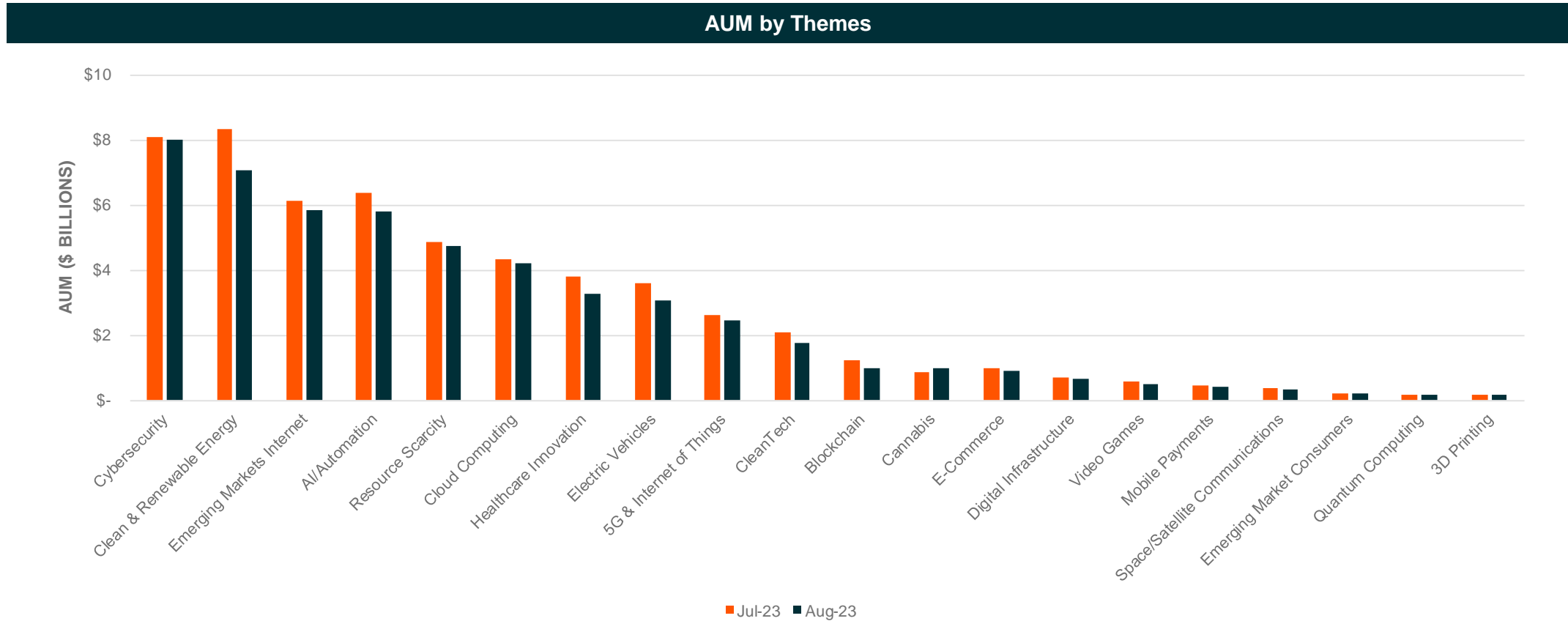


Source: Global X ETFs, Bloomberg. As of August 31, 2023.

Note: Mega-Themes may or may not add up to the Category AUM given that some ETFs considered are broad and are only classified by its Category.

# Thematic ETF Landscape: AUM by Theme

On a Theme level, Cannabis saw the largest increases in AUM in absolute terms.



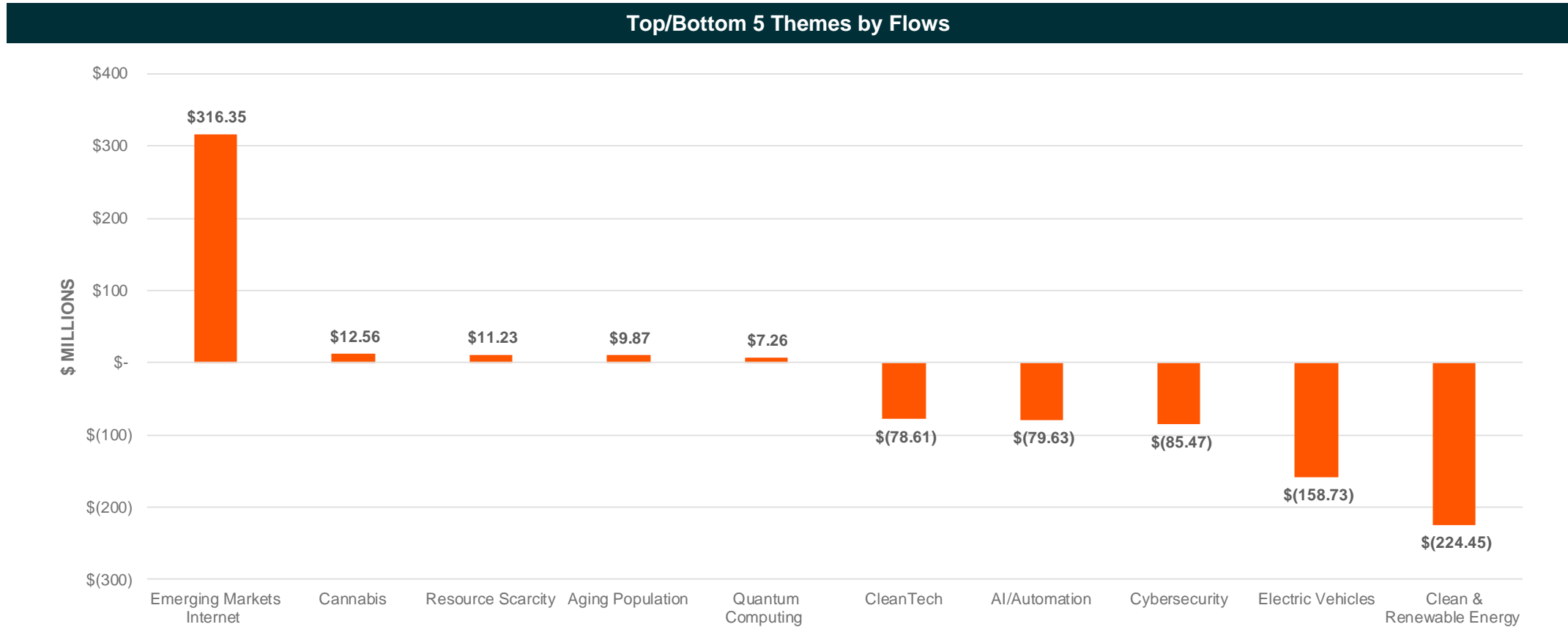
Source: Global X ETFs, Bloomberg. As of August 31, 2023.

Note: Themes may or may not add up to the Mega-Themes AUM given that some ETFs considered are broad and are only classified by its Mega-Theme.



## Thematic ETF Landscape: Flows by Theme

In terms of flows, Emerging Markets Internet Theme is the only Theme showing strong inflows, while Clean/Renewable Energy is the one experiencing the greatest outflows.



Source: Global X ETFs, Bloomberg. As of August 31, 2023.

Note: Themes may or may not add up to the Mega-Themes AUM given that some ETFs considered are broad and are only classified by its Mega-Theme.

## August 2023 Thematic ETFs Recap

### Top/Bottom AUM by %Δ

| Ticker | Name                                      | Aug-23   | Jul-23   | %Δ   |
|--------|---|----------|----------|------|
| MSOS   | AdvisorShares Pure US Cannabis ETF        | \$459.76 | \$362.33 | 27%  |
| AGNG   | Global X Longevity Thematic ETF           | \$54.12  | \$45.39  | 19%  |
| YOLO   | AdvisorShares Pure Cannabis ETF           | \$41.18  | \$36.39  | 13%  |
| CNBS   | Amplify Seymour Cannabis ETF              | \$30.03  | \$26.63  | 13%  |
| FITE   | SPDR Kensho Future Security ETF           | \$34.29  | \$30.45  | 13%  |
| DAPP   | VanEck Vectors Digital Transformation ETF | \$46.79  | \$63.88  | -27% |
| GNOM   | Global X Genomics & Biotechnology ETF     | \$146.03 | \$202.01 | -28% |
| BKCH   | Global X Blockchain ETF                   | \$74.91  | \$108.83 | -31% |
| TIME   | Clockwise Capital Innovation ETF          | \$17.25  | \$67.86  | -75% |
| PSWD   | Xtrackers Cybersecurity Select Equity ETF | \$5.25   | \$30.45  | -83% |

Source: Global X ETFs, Bloomberg. As of August 31, 2023.

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

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

| Ticker | Name  | Aug-23     | Jul-23     | \$ Δ     |
|--------|---|------------|------------|----------|
| PAVE   | Global X U.S. Infrastructure Development ETF        | \$5,303.15 | \$5,085.95 | \$217    |
| MSOS   | AdvisorShares Pure US Cannabis ETF                  | \$459.76   | \$362.33   | \$97     |
| AIQ    | Global X Artificial Intelligence & Tehnology ETF    | \$536.38   | \$499.70   | \$37     |
| AIRR   | First Trust RBA American Industrial Renaissance ETF | \$493.04   | \$463.20   | \$30     |
| MJ     | ETFMG Alternative Harvest ETF                       | \$253.46   | \$232.60   | \$21     |
| TAN    | Invesco Solar ETF                                   | \$1,633.88 | \$1,992.82 | -\$359   |
| ARKG   | Genomic Revolution ETF                              | \$2,082.06 | \$2,496.66 | -\$415   |
| LIT    | Global X Lithium & Battery Tech ETF                 | \$2,853.51 | \$3,375.38 | -\$522   |
| ICLN   | iShares Global Clean Energy ETF                     | \$3,480.96 | \$4,084.21 | -\$603   |
| ARKK   | ARK Innovation ETF                                  | \$7,930.35 | \$9,295.35 | -\$1,365 |

## August 2023 Thematic ETFs Recap

Strategies related to Infrastructure Development were the common denominator when it comes to inflows, while there is greater themes-diversification in terms of outflows.

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

| Ticker | Name  | MoM Flows (\$M) |
|--------|---|-----------------|
| KWEB   | KraneShares CSI China Internet ETF                  | \$316.35        |
| PAVE   | Global X U.S. Infrastructure Development ETF        | \$244.09        |
| IFRA   | iShares U.S. Infrastructure ETF                     | \$71.92         |
| AIQ    | Global X Artificial Intelligence & Tehnology ETF    | \$57.22         |
| AIRR   | First Trust RBA American Industrial Renaissance ETF | \$27.20         |
| BOTZ   | Global X Robotics & Artificial Intelligence ETF     | -\$74.31        |
| QCLN   | First Trust Nasdaq Clean Edge Green Energy ETF      | -\$75.47        |
| ICLN   | iShares Global Clean Energy ETF                     | -\$116.71       |
| LIT    | Global X Lithium & Battery Tech ETF                 | -\$161.18       |
| ARKK   | ARK Innovation ETF                                  | -\$179.70       |

Source: Global X ETFs, Bloomberg. As of August 31, 2023.

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

## August 2023 Thematic ETF Launches/Closures

In August, two new thematic ETFs were launched. Additionally, one thematic ETF was delisted during this period.

### Thematic ETF Launches

| Ticker | Name                            | Issuer      | Inception Date |
|--------|---------------------------------|-------------|----------------|
| CANC   | Tema Oncology ETF               | Tema Global | 08/15/2023     |
| LUXX   | Roundhill S&P Global Luxury ETF | Roundhill   | 08/23/2023     |

Source: Global X ETFs, Bloomberg. As of August 31, 2023.

### Thematic ETF Closures

| Ticker | Name                                    | Issuer        | Closure Date |
|--------|---|---------------|--------------|
| PSDN   | AdvisorShares Poseidon Dynamic Cnbs ETF | AdvisorShares | 08/23/2023   |

Source: Global X ETFs, Bloomberg. As of August 31, 2023.



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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.

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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# Appendix

## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme | Theme                 | Sub-Theme         |
|--------|--|----------------|----------------|-----------------|-----------------------|------------|-----------------------|-------------------|
| MRAD   | Advertising and Marketing Technology ETF                 | \$1.18         | \$1.29         | \$0.00          | Disruptive Technology | Big Data   | Cloud Computing       | MarTech           |
| WFH    | Direxion Work From Home ETF                              | \$30.60        | \$33.96        | -\$2.51         | Disruptive Technology | Big Data   | Cloud Computing       | Remote Work       |
| SKYY   | First Trust Cloud Computing ETF                          | \$2,834.40     | \$2,859.81     | -\$19.43        | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| WCLD   | WisdomTree Cloud Computing Fund                          | \$706.42       | \$756.53       | -\$6.54         | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| CLOU   | Global X Cloud Computing ETF                             | \$584.78       | \$632.21       | -\$24.83        | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| IWFH   | iShares Virtual Work and Life Multisector ETF            | \$2.99         | \$3.30         | \$0.00          | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| FCLD   | Fidelity Cloud Computing ETF                             | \$43.30        | \$43.45        | \$0.97          | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| IVES   | Wedbush ETFMG Global Cloud Technology ETF                | \$27.45        | \$24.61        | \$3.54          | Disruptive Technology | Big Data   | Cloud Computing       |                   |
| BUG    | Global X Cybersecurity ETF                               | \$657.73       | \$698.43       | -\$38.21        | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| HACK   | ETFMG Prime Cyber Security ETF                           | \$1,489.59     | \$1,494.94     | -\$20.17        | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| IHAK   | iShares Cybersecurity and Tech ETF                       | \$607.53       | \$617.62       | -\$13.37        | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| CIBR   | First Trust NASDAQ Cybersecurity ETF                     | \$5,200.79     | \$5,210.93     | -\$17.57        | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| WCBR   | WisdomTree Cybersecurity ETF                             | \$34.22        | \$34.22        | \$0.00          | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| FITE   | SPDR Kensho Future Security ETF                          | \$34.29        | \$30.45        | \$3.83          | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| PSWD   | Xtrackers Cybersecurity Select Equity ETF                | \$5.25         | \$30.45        | \$0.02          | Disruptive Technology | Big Data   | Cybersecurity         |                   |
| WTAI   | WisdomTree Artifcl Intlgncl & Innvtl ETF                 | \$156.03       | \$161.36       | \$7.06          | Disruptive Technology | Big Data   | Machine/Deep Learning |                   |
| QTUM   | Defiance Quantum ETF                                     | \$177.51       | \$177.63       | \$7.26          | Disruptive Technology | Big Data   | Quantum Computing     |                   |
| AIQ    | Global X Artificial Intelligence & Tehnology ETF         | \$536.38       | \$499.70       | \$57.22         | Disruptive Technology | Big Data   |                       |                   |
| THNQ   | ROBO Global® Artificial Intelligence ETF                 | \$60.35        | \$58.72        | \$4.68          | Disruptive Technology | Big Data   |                       |                   |
| XDAT   | Franklin Exponential Data ETF                            | \$3.76         | \$3.93         | \$0.00          | Disruptive Technology | Big Data   |                       |                   |
| DAT    | ProShares Big Data Refineres ETF                         | \$3.48         | \$3.83         | \$0.00          | Disruptive Technology | Big Data   |                       |                   |
| TRFK   | Pacer Data and Digital Revolution ETF                    | \$5.16         | \$3.89         | \$1.24          | Disruptive Technology | Big Data   |                       |                   |
| CHAT   | Roundhill Generative AI & Technology ETF                 | \$85.51        | \$90.67        | -\$1.39         | Disruptive Technology | Big Data   |                       |                   |
| WBAT   | WisdomTree Battery Val Chn & Innvt ETF                   | \$4.83         | \$5.42         | \$0.00          | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| ZSB    | USCF Sustainable Battery Metals Stgy Fd                  | \$2.02         | \$2.23         | \$0.00          | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| BATT   | Amplify Advanced Battery Metals and Materials ETF        | \$141.43       | \$161.51       | \$0.00          | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| LITP   | Sprott Lithium Miners ETF                                | \$4.93         | \$4.81         | \$0.63          | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| LIT    | Global X Lithium & Battery Tech ETF                      | \$2,853.51     | \$3,375.38     | -\$161.18       | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| ILIT   | iShares Lithium Miners And Producers ETF                 | \$4.04         | \$4.73         | \$0.00          | Disruptive Technology | Mobility   | Electric Vehicles     | Lithium/Batteries |
| FDRV   | Fidelity Electric Vehicles and Future Transportation ETF | \$54.06        | \$59.47        | \$1.01          | Disruptive Technology | Mobility   | Electric Vehicles     |                   |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme          | Theme             | Sub-Theme |
|--------|--|----------------|----------------|-----------------|-----------------------|---------------------|-------------------|-----------|
| EVXX   | Defiance Pure Electric Vehicle ETF                                     | \$5.57         | \$6.86         | \$0.81          | Disruptive Technology | Mobility            | Electric Vehicles |           |
| DRIV   | Global X Autonomous & Electric Vehicles ETF                            | \$802.87       | \$954.49       | -\$59.49        | Disruptive Technology | Mobility            |                   |           |
| CLNR   | IQ Cleaner Transport   | \$6.68         | \$7.09         | \$0.00          | Disruptive Technology | Mobility            |                   |           |
| MOTO   | The SmartETFs Smart Transportation & Technology ETF                    | \$13.77        | \$13.49        | \$1.03          | Disruptive Technology | Mobility            |                   |           |
| KARS   | KraneShares Electric Vehicles and Future Mobility Index ETF            | \$177.35       | \$197.77       | \$4.41          | Disruptive Technology | Mobility            |                   |           |
| VCAR   | Simplify Volt RoboCar Disruption ETF                                   | \$4.24         | \$4.52         | \$0.00          | Disruptive Technology | Mobility            |                   |           |
| HAIL   | SPDR Kensho Smart Mobility ETF   | \$51.09        | \$61.44        | -\$0.97         | Disruptive Technology | Mobility            |                   |           |
| IDRV   | iShares Self-Driving EV and Tech ETF                                   | \$426.70       | \$494.14       | -\$3.95         | Disruptive Technology | Mobility            |                   |           |
| SOCL   | Global X Social Media ETF  | \$135.76       | \$147.98       | -\$3.51         | Disruptive Technology | Digital Experiences | Social Media      |           |
| OND    | ProShares On-Demand ETF  | \$0.58         | \$0.63         | \$0.00          | Disruptive Technology | Digital Experiences | Streaming         |           |
| HERO   | Global X Video Games & Esports ETF                                     | \$166.54       | \$183.51       | -\$2.58         | Disruptive Technology | Digital Experiences | Video Games       | Esports   |
| ESPO   | Video Gaming and eSports ETF   | \$268.73       | \$302.95       | -\$10.79        | Disruptive Technology | Digital Experiences | Video Games       | Esports   |
| NERD   | Roundhill BITKRAFT Esports & Digital Entertainment ETF                 | \$22.10        | \$25.33        | -\$1.08         | Disruptive Technology | Digital Experiences | Video Games       | Esports   |
| BNGE   | First Trust S-Network Strmg & Gmng ETF                                 | \$4.37         | \$4.65         | \$0.00          | Disruptive Technology | Digital Experiences | Video Games       |           |
| GAMR   | ETFMG Video Game Tech ETF  | \$45.77        | \$50.36        | \$0.00          | Disruptive Technology | Digital Experiences | Video Games       |           |
| METV   | Roundhill Ball Metaverse ETF   | \$444.39       | \$503.97       | -\$20.43        | Disruptive Technology | Digital Experiences |                   |           |
| IVRS   | iShares Future Metaverse Tec And Com ETF                               | \$5.83         | \$6.20         | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| FMET   | Fidelity Metaverse ETF   | \$17.89        | \$19.13        | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| ARVR   | First Trust Indxx Metaverse ETF  | \$1.53         | \$1.65         | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| VR     | Global X Metaverse ETF   | \$2.31         | \$2.52         | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| ODDS   | Pacer BlueStar Digital Entertainment ETF                               | \$0.79         | \$0.87         | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| VERS   | ProShares Metaverse ETF  | \$6.37         | \$7.09         | \$0.00          | Disruptive Technology | Digital Experiences |                   |           |
| BKCH   | Global X Blockchain ETF  | \$74.91        | \$108.83       | -\$2.67         | Disruptive Technology | FinTech             | Blockchain        |           |
| SATO   | Invesco Alerian Galaxy Crypto Economy ETF                              | \$4.36         | \$5.52         | \$0.00          | Disruptive Technology | FinTech             | Blockchain        |           |
| BLKC   | Invesco Alerian Galaxy Blockchain Users and Decentralized Commerce ETF | \$2.68         | \$2.96         | \$0.00          | Disruptive Technology | FinTech             | Blockchain        |           |
| DAPP   | VanEck Vectors Digital Transformation ETF                              | \$46.79        | \$63.88        | -\$2.45         | Disruptive Technology | FinTech             | Blockchain        |           |
| BITQ   | Bitwise Crypto Industry Innovators ETF                                 | \$82.83        | \$111.78       | -\$1.43         | Disruptive Technology | FinTech             | Blockchain        |           |
| KOIN   | Innovation Shares NextGen Protocol ETF                                 | \$13.49        | \$14.68        | -\$0.76         | Disruptive Technology | FinTech             | Blockchain        |           |
| BLOK   | Amplify Transformational Data Sharing ETF                              | \$480.62       | \$592.13       | -\$17.76        | Disruptive Technology | FinTech             | Blockchain        |           |
| LEGR   | First Trust Indxx Innovative Transaction & Process ETF                 | \$107.87       | \$111.55       | \$0.00          | Disruptive Technology | FinTech             | Blockchain        |           |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name  | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme   | Theme                          | Sub-Theme    |
|--------|---|----------------|----------------|-----------------|-----------------------|--------------|--------------------------------|--------------|
| BLCN   | Reality Shares Nasdaq NexGen Economy ETF                      | \$68.74        | \$80.40        | -\$2.03         | Disruptive Technology | FinTech      | Blockchain                     |              |
| WGMI   | Valkyrie Bitcoin Miners ETF                                   | \$17.89        | \$24.09        | \$0.27          | Disruptive Technology | FinTech      | Blockchain                     |              |
| CRPT   | First Trust SkyBridge Crypto Industry and Digital Economy ETF | \$19.61        | \$26.17        | \$0.00          | Disruptive Technology | FinTech      | Blockchain                     |              |
| FDIG   | Fidelity Crypto Industry & Digital Payments ETF               | \$42.10        | \$53.23        | \$0.23          | Disruptive Technology | FinTech      | Blockchain                     |              |
| IBLC   | iShares Blockchain and Tech ETF                               | \$8.31         | \$9.48         | \$1.16          | Disruptive Technology | FinTech      | Blockchain                     |              |
| STCE   | Schwab Crypto Thematic ETF                                    | \$12.03        | \$14.54        | \$0.00          | Disruptive Technology | FinTech      | Blockchain                     |              |
| BCDF   | Horizon Kinetics Blockchain Dev ETF                           | \$3.25         | \$3.40         | \$0.00          | Disruptive Technology | FinTech      | Blockchain                     |              |
| BWEB   | Bitwise Web3 ETF  | \$0.80         | \$0.92         | \$0.00          | Disruptive Technology | FinTech      | Blockchain                     |              |
| IPAY   | ETFMG Prime Mobile Payments ETF                               | \$398.50       | \$437.17       | -\$6.16         | Disruptive Technology | FinTech      | Mobile Payments                |              |
| GFOF   | Grayscale Future of Finance ETF                               | \$5.30         | \$6.95         | \$0.00          | Disruptive Technology | FinTech      |                                |              |
| FINX   | Global X FinTech ETF  | \$368.60       | \$441.79       | -\$19.70        | Disruptive Technology | FinTech      |                                |              |
| ARKF   | Fintech Innovation ETF  | \$905.76       | \$1,088.29     | -\$41.80        | Disruptive Technology | FinTech      |                                |              |
| EMFQ   | Amplify Emerging Market FinTech ETF                           | \$2.19         | \$2.39         | \$0.00          | Disruptive Technology | FinTech      |                                |              |
| BPAY   | BlackRock Future Financial and Tech ETF                       | \$4.30         | \$4.51         | \$0.00          | Disruptive Technology | FinTech      |                                |              |
| FDFE   | Fidelity@ Disruptive Finance ETF                              | \$43.85        | \$44.25        | \$0.05          | Disruptive Technology | FinTech      |                                |              |
| VPN    | Global X Data Center REITs & Digital Infrastructure ETF       | \$30.86        | \$31.06        | \$0.52          | Disruptive Technology | Connectivity | Digital Infrastructure         |              |
| SRVR   | Pacer Benchmark Data & Infrastructure Real Estate SCTR ETF    | \$576.64       | \$607.96       | -\$12.74        | Disruptive Technology | Connectivity | Digital Infrastructure         |              |
| GREI   | Goldman Sachs FT RL Estt & Infrs Eq ETF                       | \$23.43        | \$24.49        | \$0.00          | Disruptive Technology | Connectivity | Digital Infrastructure         |              |
| BYTE   | Roundhill IO Digital Infrastructure ETF                       | \$1.22         | \$2.94         | -\$1.67         | Disruptive Technology | Connectivity | Digital Infrastructure         |              |
| WTRE   | WisdomTree New Economy Real Estate Fund ETF                   | \$22.13        | \$23.56        | -\$0.86         | Disruptive Technology | Connectivity | Digital Infrastructure         |              |
| KFVG   | KraneShares CICC China 5G and Technology leaders Index ETF    | \$13.48        | \$14.35        | \$0.00          | Disruptive Technology | Connectivity | 5G & Internet of Things        |              |
| GRID   | First Trust Nasdaq Clean Edge Smart GRID Infrastructure Index | \$1,105.75     | \$1,159.91     | -\$4.37         | Disruptive Technology | Connectivity | 5G & Internet of Things        | Smart Cities |
| SIMS   | SPDR Kensho Intelligent Structure ETF                         | \$22.70        | \$24.71        | \$0.00          | Disruptive Technology | Connectivity | 5G & Internet of Things        | Smart Cities |
| FIVG   | Defiance Next Gen Connectivity ETF                            | \$600.34       | \$640.25       | -\$26.05        | Disruptive Technology | Connectivity | 5G & Internet of Things        |              |
| NXTG   | First Trust Indxx NextG ETF                                   | \$403.35       | \$426.26       | -\$10.46        | Disruptive Technology | Connectivity | 5G & Internet of Things        |              |
| WUGI   | Esoterica NextG Economy ETF                                   | \$25.03        | \$23.75        | \$2.28          | Disruptive Technology | Connectivity | 5G & Internet of Things        |              |
| SNSR   | Global X Internet of Things ETF                               | \$297.65       | \$351.67       | -\$28.69        | Disruptive Technology | Connectivity | 5G & Internet of Things        |              |
| KWEB   | KraneShares CSI China Internet ETF                            | \$5,845.44     | \$6,118.93     | \$316.35        | Disruptive Technology | Connectivity | Emerging Markets Internet      |              |
| ROKT   | SPDR Kensho Final Frontiers ETF                               | \$17.53        | \$18.00        | \$0.00          | Disruptive Technology | Connectivity | Space/Satellite Communications |              |
| UFO    | Procore Space ETF   | \$43.85        | \$49.43        | -\$2.47         | Disruptive Technology | Connectivity | Space/Satellite Communications |              |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name  | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme   | Theme                          | Sub-Theme |
|--------|---|----------------|----------------|-----------------|-----------------------|--------------|--------------------------------|-----------|
| ARKX   | Ark Space Exploration                                       | \$277.09       | \$298.94       | -\$3.49         | Disruptive Technology | Connectivity | Space/Satellite Communications |           |
| PNQI   | Invesco NASDAQ Internet ETF                                 | \$586.08       | \$617.59       | -\$7.25         | Disruptive Technology | Connectivity |                                |           |
| ARKW   | ARK Next Generation Internet ETF                            | \$1,372.49     | \$1,650.51     | -\$58.79        | Disruptive Technology | Connectivity |                                |           |
| XWEB   | SPDR S&P Internet ETF                                       | \$22.63        | \$25.00        | -\$0.83         | Disruptive Technology | Connectivity |                                |           |
| OGIG   | ALPS OShares Global Internet Giants ETF                     | \$145.47       | \$153.99       | -\$3.12         | Disruptive Technology | Connectivity |                                |           |
| FDCF   | Fidelity® Disruptive Communications ETF                     | \$39.61        | \$41.42        | \$0.00          | Disruptive Technology | Connectivity |                                |           |
| PRNT   | 3D Printing ETF   | \$162.38       | \$185.86       | -\$5.58         | Disruptive Technology | Robotics     | 3D Printing                    |           |
| ARKQ   | ARK Autonomous Technology & Robotics ETF                    | \$1,074.28     | \$1,170.66     | -\$28.90        | Disruptive Technology | Robotics     | AI/Automation                  |           |
| BOTZ   | Global X Robotics & Artificial Intelligence ETF             | \$2,293.69     | \$2,577.62     | -\$74.31        | Disruptive Technology | Robotics     | AI/Automation                  |           |
| ROBO   | ROBO Global Robotics and Automation Index ETF               | \$1,401.88     | \$1,538.90     | -\$20.42        | Disruptive Technology | Robotics     | AI/Automation                  |           |
| ROBT   | First Trust Nasdaq Artificial Intelligence and Robotics ETF | \$428.28       | \$442.28       | \$26.29         | Disruptive Technology | Robotics     | AI/Automation                  |           |
| IRBO   | iShares Robotics and Artificial Intelligence ETF            | \$488.21       | \$511.02       | \$20.11         | Disruptive Technology | Robotics     | AI/Automation                  |           |
| IQM    | Franklin Intelligent Machines ETF                           | \$21.47        | \$24.82        | -\$2.39         | Disruptive Technology | Robotics     | AI/Automation                  |           |
| MAKX   | ProShares S&P Kensho Smart Factories ETF                    | \$0.89         | \$0.96         | \$0.00          | Disruptive Technology | Robotics     | AI/Automation                  |           |
| IBOT   | VanEck Robotics ETF   | \$2.82         | \$2.94         | \$0.00          | Disruptive Technology | Robotics     | AI/Automation                  |           |
| FBOT   | Fidelity® Disruptive Automation ETF                         | \$108.82       | \$113.87       | \$0.00          | Disruptive Technology | Robotics     | AI/Automation                  |           |
| BULD   | Pacer BlueStar Engineering the Future ETF                   | \$1.65         | \$1.75         | \$0.00          | Disruptive Technology | Robotics     |                                |           |
| PTEC   | Global X Prop Tech ETF                                      | \$2.86         | \$2.97         | \$0.00          | Disruptive Technology | PropTech     |                                |           |
| LZRD   | Parabla Innovation ETF                                      | \$0.76         | \$0.87         | \$0.00          | Disruptive Technology |              |                                |           |
| XT     | iShares Exponential Technologies ETF                        | \$3,282.06     | \$3,467.55     | \$0.00          | Disruptive Technology |              |                                |           |
| XITK   | SPDR FactSet Innovative Technology ETF                      | \$101.65       | \$106.54       | \$1.28          | Disruptive Technology |              |                                |           |
| DTEC   | ALPS Disruptive Technologies ETF                            | \$103.21       | \$112.78       | -\$2.81         | Disruptive Technology |              |                                |           |
| LOUP   | Innovator Loup Frontier Tech ETF                            | \$37.95        | \$43.13        | -\$1.92         | Disruptive Technology |              |                                |           |
| ARKK   | ARK Innovation ETF  | \$7,930.35     | \$9,295.35     | -\$179.70       | Disruptive Technology |              |                                |           |
| KOMP   | SPDR Kensho New Economies Composite ETF                     | \$1,760.32     | \$1,914.01     | \$5.87          | Disruptive Technology |              |                                |           |
| IZRL   | ARK Israel Innovative Technology ETF                        | \$99.35        | \$99.93        | -\$1.56         | Disruptive Technology |              |                                |           |
| IETC   | iShares Evolved U.S. Technology ETF                         | \$159.67       | \$156.46       | \$2.73          | Disruptive Technology |              |                                |           |
| PLAT   | WisdomTree Growth Leaders ETF                               | \$11.72        | \$12.37        | \$0.00          | Disruptive Technology |              |                                |           |
| TECB   | iShares US Tech Breakthrough Multisector ETF                | \$314.38       | \$317.19       | \$1.89          | Disruptive Technology |              |                                |           |
| GINN   | Goldman Sachs Innovate Equity ETF                           | \$336.07       | \$355.45       | -\$2.64         | Disruptive Technology |              |                                |           |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme | Theme | Sub-Theme |
|--------|--|----------------|----------------|-----------------|-----------------------|------------|-------|-----------|
| MOON   | Direxion Moonshot Technologies ETF           | \$32.28        | \$40.41        | -\$0.38         | Disruptive Technology |            |       |           |
| BTEK   | BlackRock Future Tech ETF                    | \$14.00        | \$14.56        | \$0.00          | Disruptive Technology |            |       |           |
| BFTR   | BlackRock Future Innovators ETF              | \$6.87         | \$7.20         | \$0.00          | Disruptive Technology |            |       |           |
| ANEW   | MSCI Transformational Changes ETF            | \$8.23         | \$8.63         | \$0.00          | Disruptive Technology |            |       |           |
| TMAT   | Main Thematic Innovation ETF                 | \$93.07        | \$102.61       | \$1.49          | Disruptive Technology |            |       |           |
| GGRW   | Gabelli Funds' Growth Innovators ETF         | \$2.74         | \$2.73         | \$0.00          | Disruptive Technology |            |       |           |
| IDAT   | iShares Cloud 5G and Tech ETF                | \$5.92         | \$6.15         | \$0.00          | Disruptive Technology |            |       |           |
| ILDR   | First Trust Innovation Leaders ETF           | \$15.49        | \$3.77         | \$11.76         | Disruptive Technology |            |       |           |
| MVPS   | Amplify Thematic All-Stars ETF               | \$3.78         | \$4.08         | \$0.00          | Disruptive Technology |            |       |           |
| SPRX   | Spear Alpha ETF                              | \$10.63        | \$12.35        | -\$0.37         | Disruptive Technology |            |       |           |
| JFWD   | Jacob Forward ETF                            | \$2.83         | \$3.22         | \$0.00          | Disruptive Technology |            |       |           |
| GK     | AdvisorShares Gerber Kawasaki ETF            | \$17.38        | \$18.16        | \$0.09          | Disruptive Technology |            |       |           |
| FFND   | The Future Fund Active ETF                   | \$9.51         | \$9.63         | \$0.00          | Disruptive Technology |            |       |           |
| GTEK   | Goldman Sachs Future Tech Leaders Equity ETF | \$255.90       | \$272.54       | \$0.00          | Disruptive Technology |            |       |           |
| TINY   | ProShares Nanotechnology ETF                 | \$2.88         | \$3.03         | \$0.00          | Disruptive Technology |            |       |           |
| KGRO   | KraneShares China Innovation ETF             | \$1.42         | \$1.57         | \$0.00          | Disruptive Technology |            |       |           |
| INNO   | Harbor Disruptive Innovation ETF             | \$30.32        | \$31.77        | \$0.00          | Disruptive Technology |            |       |           |
| BTHM   | Blackrock Future US Themes ETF               | \$4.89         | \$4.94         | \$0.00          | Disruptive Technology |            |       |           |
| DGIN   | VanEck Digital India ETF                     | \$3.27         | \$2.39         | \$0.80          | Disruptive Technology |            |       |           |
| SAMT   | Strategas Macro Thematic Opp ETF             | \$67.37        | \$67.45        | \$0.70          | Disruptive Technology |            |       |           |
| TIME   | Clockwise Capital Innovation ETF             | \$17.25        | \$67.86        | -\$48.26        | Disruptive Technology |            |       |           |
| KEJI   | Global X China Disruption ETF                | \$2.06         | \$2.20         | \$0.00          | Disruptive Technology |            |       |           |
| GXTG   | Global X Thematic Growth ETF                 | \$38.16        | \$42.52        | \$0.49          | Disruptive Technology |            |       |           |
| FWD    | AB Disruptors ETF                            | \$125.63       | \$119.33       | \$9.65          | Disruptive Technology |            |       |           |
| NBDS   | Neuberger Berman Disrupters ETF              | \$11.17        | \$10.90        | \$0.58          | Disruptive Technology |            |       |           |
| TRFM   | AAM Transformers ETF                         | \$20.92        | \$21.41        | \$0.70          | Disruptive Technology |            |       |           |
| MINV   | Matthews Asia Innovators Active ETF          | \$114.12       | \$143.70       | -\$20.52        | Disruptive Technology |            |       |           |
| TWEB   | SoFi Web 3 ETF                               | \$1.39         | \$1.62         | -\$0.65         | Disruptive Technology |            |       |           |
| BKIV   | BNY Mellon Innovators ETF                    | \$10.80        | \$11.58        | \$0.00          | Disruptive Technology |            |       |           |
| FDTX   | Fidelity® Disruptive Technology ETF          | \$102.07       | \$108.25       | \$0.00          | Disruptive Technology |            |       |           |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme   | Theme                     | Sub-Theme |
|--------|--|----------------|----------------|-----------------|-----------------------|--------------|---------------------------|-----------|
| FDIF   | Fidelity® Disruptors ETF                                   | \$91.10        | \$98.03        | -\$2.36         | Disruptive Technology |              |                           |           |
| POTX   | Global X Cannabis ETF                                      | \$36.16        | \$34.12        | \$0.69          | People & Demographics | New Consumer | Cannabis                  |           |
| YOLO   | AdvisorShares Pure Cannabis ETF                            | \$41.18        | \$36.39        | -\$0.39         | People & Demographics | New Consumer | Cannabis                  |           |
| MJUS   | ETFMG U.S. Alternative Harvest ETF                         | \$128.30       | \$129.36       | -\$11.82        | People & Demographics | New Consumer | Cannabis                  |           |
| MJ     | ETFMG Alternative Harvest ETF                              | \$253.46       | \$232.60       | \$2.73          | People & Demographics | New Consumer | Cannabis                  |           |
| THCX   | The Cannabis ETF   | \$16.22        | \$16.25        | -\$0.40         | People & Demographics | New Consumer | Cannabis                  |           |
| TOKE   | Cambria Cannabis ETF                                       | \$10.86        | \$10.97        | \$0.00          | People & Demographics | New Consumer | Cannabis                  |           |
| CNBS   | Amplify Seymour Cannabis ETF                               | \$30.03        | \$26.63        | \$0.00          | People & Demographics | New Consumer | Cannabis                  |           |
| MSOS   | AdvisorShares Pure US Cannabis ETF                         | \$459.76       | \$362.33       | \$21.74         | People & Demographics | New Consumer | Cannabis                  |           |
| WEED   | Roundhill Cannabis ETF                                     | \$2.61         | \$2.25         | \$0.00          | People & Demographics | New Consumer | Cannabis                  |           |
| BUYZ   | Franklin Disruptive Commerce ETF                           | \$10.41        | \$11.05        | \$0.00          | People & Demographics | New Consumer | E-Commerce                |           |
| IBUY   | Amplify Online Retail ETF                                  | \$200.10       | \$227.84       | -\$6.87         | People & Demographics | New Consumer | E-Commerce                |           |
| ONLN   | ProShares Online Retail ETF                                | \$100.56       | \$112.15       | -\$2.83         | People & Demographics | New Consumer | E-Commerce                |           |
| EBIZ   | Global X E-commerce ETF                                    | \$61.35        | \$60.00        | \$6.76          | People & Demographics | New Consumer | E-Commerce                |           |
| EWEB   | Global X Emerging Markets E-commerce & Internet ETF        | \$2.67         | \$2.89         | \$0.00          | People & Demographics | New Consumer | E-Commerce                |           |
| EMQQ   | Emerging Markets Internet & Ecommerce ETF                  | \$496.37       | \$543.40       | -\$9.33         | People & Demographics | New Consumer | E-Commerce                |           |
| FMQQ   | The Next Frontier Internet & Ecommerce ETF                 | \$18.87        | \$18.94        | \$1.05          | People & Demographics | New Consumer | E-Commerce                |           |
| EDUT   | Global X Education ETF                                     | \$2.88         | \$3.29         | -\$0.21         | People & Demographics | New Consumer | Education                 |           |
| KEMQ   | KraneShares Emerging Markets Consumer Technology Index ETF | \$11.92        | \$12.77        | -\$1.60         | People & Demographics | New Consumer | Emerging Market Consumers |           |
| ECON   | Columbia Emerging Markets Consumer ETF                     | \$67.36        | \$73.34        | -\$2.13         | People & Demographics | New Consumer | Emerging Market Consumers |           |
| INCO   | Columbia India Consumer ETF                                | \$117.44       | \$118.23       | \$5.25          | People & Demographics | New Consumer | Emerging Market Consumers |           |
| INQQ   | India Internet & Ecommerce ETF                             | \$8.25         | \$6.57         | \$1.61          | People & Demographics | New Consumer | Emerging Market Consumers |           |
| MILN   | Global X Millennials Thematic ETF                          | \$103.98       | \$109.83       | \$0.01          | People & Demographics | New Consumer | Millennials & Gen Z       |           |
| GENY   | Principal Millennials Index ETF                            | \$31.86        | \$31.47        | \$2.19          | People & Demographics | New Consumer | Millennials & Gen Z       |           |
| NBCC   | Neuberger Brmn Nxt Grnrn Cnncd Cnsm ETF                    | \$5.41         | \$5.64         | \$0.00          | People & Demographics | New Consumer | Millennials & Gen Z       |           |
| KPOP   | KPOP and Korean Entertainment ETF                          | \$3.01         | \$3.03         | \$0.19          | People & Demographics | New Consumer | Millennials & Gen Z       |           |
| LUXX   | Roundhill S&P Global Luxury ETF                            | \$1.26         | \$0.00         | \$1.25          | People & Demographics | New Consumer | Millennials & Gen Z       |           |
| BYOB   | SoFi Gig Economy ETF                                       | \$7.05         | \$8.28         | -\$0.33         | People & Demographics | New Consumer | Sharing/Gig Economy       |           |
| iBET   | iBet Sprts Betting & Gaming ETF                            | \$0.72         | \$0.78         | \$0.00          | People & Demographics | New Consumer | Sports Betting            |           |
| BETZ   | Roundhill Sports Betting & iGaming ETF                     | \$108.46       | \$119.38       | -\$3.96         | People & Demographics | New Consumer | Sports Betting            |           |

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## Appendix – Classification of Thematic ETFs

| Ticker | Name  | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme   | Theme                 | Sub-Theme                     |
|--------|---|----------------|----------------|-----------------|-----------------------|--------------|-----------------------|-------------------------------|
| GBUY   | Goldman Sachs Future Consumer Equity ETF            | \$156.21       | \$164.81       | \$0.70          | People & Demographics | New Consumer |                       |                               |
| AWAY   | ETFMG Travel Tech ETF                               | \$110.30       | \$121.21       | -\$5.31         | People & Demographics | New Consumer |                       |                               |
| LUX    | Tema Luxury ETF                                     | \$7.83         | \$7.60         | \$0.73          | People & Demographics | New Consumer |                       |                               |
| AGNG   | Global X Longevity Thematic ETF                     | \$54.12        | \$45.39        | \$9.87          | People & Demographics | Health       | Aging Population      |                               |
| HLGE   | The Hartford Longevity Economy ETF                  | \$8.94         | \$9.17         | \$0.00          | People & Demographics | Health       | Aging Population      |                               |
| CHNA   | Loncar China BioPharma ETF                          | \$4.16         | \$4.62         | \$0.00          | People & Demographics | Health       | EM Healthcare         |                               |
| PSIL   | AdvisorShares Psychedelics ETF                      | \$6.57         | \$7.73         | \$0.07          | People & Demographics | Health       | Healthcare Innovation | Alternative Medicine          |
| ARKG   | Genomic Revolution ETF                              | \$2,082.06     | \$2,496.66     | -\$11.22        | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| GNOM   | Global X Genomics & Biotechnology ETF               | \$146.03       | \$202.01       | -\$39.46        | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| XDNA   | Kelly CRISPR & Gene Editing Tech ETF                | \$2.45         | \$2.55         | \$0.20          | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| IDNA   | iShares Genomics Immunology and Healthcare ETF      | \$134.09       | \$144.99       | -\$2.20         | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| PBE    | Invesco Dynamic Biotechnology & Genome ETF          | \$243.55       | \$251.91       | -\$0.61         | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| HELX   | Franklin Genomic Discovery ETF                      | \$9.23         | \$10.94        | -\$1.52         | People & Demographics | Health       | Healthcare Innovation | Genomics                      |
| CNCR   | Loncar Cancer Immunotherapy ETF                     | \$9.64         | \$11.01        | -\$0.63         | People & Demographics | Health       | Healthcare Innovation | Immunotherapy                 |
| VIRS   | Pacer BioThreat ETF                                 | \$3.97         | \$4.01         | \$0.00          | People & Demographics | Health       | Healthcare Innovation | Public Health                 |
| EDOC   | Global X Telemedicine & Digital Health ETF          | \$100.79       | \$120.62       | -\$3.24         | People & Demographics | Health       | Healthcare Innovation | Telemedicine & Digital Health |
| FDHT   | Fidelity Digital Health ETF                         | \$9.11         | \$10.17        | \$0.00          | People & Demographics | Health       | Healthcare Innovation | Telemedicine & Digital Health |
| EKG    | First Trust Nasdaq Lux Digital Health Solutions ETF | \$0.81         | \$0.91         | \$0.00          | People & Demographics | Health       | Healthcare Innovation | Telemedicine & Digital Health |
| SYNB   | Putnam Biorevolution ETF                            | \$4.99         | \$4.97         | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| GDOC   | Goldman Sachs Future Health Care EQ ETF             | \$111.84       | \$114.65       | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| PINK   | The Simplify Health Care ETF                        | \$76.02        | \$71.98        | \$9.96          | People & Demographics | Health       | Healthcare Innovation |                               |
| WDNA   | WisdomTree BioRevolution ETF                        | \$2.69         | \$2.89         | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| HART   | IQ Healthy Hearts ETF                               | \$8.49         | \$8.64         | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| CHB    | Global X China Biotech Innovation ETF               | \$1.96         | \$2.15         | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| GERM   | ETFMG Treatments, Testing and Advancements ETF      | \$14.70        | \$16.58        | -\$1.00         | People & Demographics | Health       | Healthcare Innovation |                               |
| SBIO   | ALPS Medical Breakthroughs ETF                      | \$103.09       | \$110.26       | -\$2.32         | People & Demographics | Health       | Healthcare Innovation |                               |
| BTEC   | Principal Healthcare Innovators Index ETF           | \$52.44        | \$55.27        | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| HTEC   | ROBO Global Healthcare Technology & Innovation      | \$88.10        | \$95.01        | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |
| BMED   | BlackRock Future Health ETF                         | \$3.83         | \$5.94         | -\$1.91         | People & Demographics | Health       | Healthcare Innovation |                               |
| IBRN   | iShares Neuroscience and Healthcare ETF             | \$4.61         | \$4.93         | \$0.00          | People & Demographics | Health       | Healthcare Innovation |                               |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.



## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category              | Mega-Theme     | Theme                    | Sub-Theme        |
|--------|--|----------------|----------------|-----------------|-----------------------|----------------|--------------------------|------------------|
| FMED   | Fidelity® Disruptive Medicine ETF              | \$41.41        | \$43.34        | \$0.00          | People & Demographics | Health         | Healthcare Innovation    |                  |
| BFIT   | Global X Health & Wellness Thematic ETF        | \$14.19        | \$16.52        | -\$1.62         | People & Demographics | Health         | Health & Wellness        |                  |
| CANC   | Tema Oncology ETF                              | \$2.25         | \$0.00         | \$2.25          | People & Demographics | Health         | Health & Wellness        |                  |
| SURI   | Simplify Propel Opportunities ETF              | \$101.15       | \$102.54       | \$1.71          | People & Demographics | Health         |                          |                  |
| UPWD   | JPMorgan Social Advancement ETF                | \$12.33        | \$12.74        | \$0.00          | People & Demographics |                |                          |                  |
| HYDR   | Global X Hydrogen ETF                          | \$45.65        | \$52.18        | \$3.03          | Physical Environment  | Climate Change | Clean & Renewable Energy | Hydrogen         |
| HJEN   | Direxion Hydrogen ETF                          | \$30.00        | \$33.40        | \$0.00          | Physical Environment  | Climate Change | Clean & Renewable Energy | Hydrogen         |
| HDRO   | Defiance Next Gen H2 ETF                       | \$31.11        | \$36.47        | \$0.00          | Physical Environment  | Climate Change | Clean & Renewable Energy | Hydrogen         |
| RAYS   | Global X Solar ETF                             | \$3.26         | \$3.85         | \$0.00          | Physical Environment  | Climate Change | Clean & Renewable Energy | Solar            |
| TAN    | Invesco Solar ETF                              | \$1,633.88     | \$1,992.82     | -\$65.71        | Physical Environment  | Climate Change | Clean & Renewable Energy | Solar            |
| WNDY   | Global X Wind Energy ETF                       | \$3.97         | \$4.57         | \$0.00          | Physical Environment  | Climate Change | Clean & Renewable Energy | Wind             |
| FAN    | First Trust ISE Global Wind Energy Index Fund  | \$222.97       | \$245.21       | -\$3.22         | Physical Environment  | Climate Change | Clean & Renewable Energy | Wind             |
| ICLN   | iShares Global Clean Energy ETF                | \$3,480.96     | \$4,084.21     | -\$116.71       | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| RNRG   | Global X Renewable Energy Producers ETF        | \$56.35        | \$63.07        | -\$0.92         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| VCLN   | Virtus Duff & Phelps Clean Energy ETF          | \$7.47         | \$3.15         | \$4.65          | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| FRNW   | Fidelity Clean Energy ETF                      | \$31.97        | \$37.49        | -\$0.97         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| BNE    | Blue Horizon New Energy Economy ETF            | \$5.44         | \$6.19         | \$0.00          | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| CNRG   | SPDR Kensho Clean Power ETF                    | \$303.73       | \$331.64       | -\$0.97         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| PBW    | Invesco WilderHill Clean Energy ETF            | \$596.44       | \$754.27       | -\$35.50        | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| SMOG   | VanEck Vectors Global Alternative Energy ETF   | \$183.12       | \$212.12       | -\$5.68         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| ACES   | ALPS Clean Energy ETF                          | \$432.30       | \$493.06       | -\$2.22         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| RNWZ   | TrueShares Eagle Gbl Rnwbls Engy IncETF        | \$2.49         | \$2.96         | -\$0.23         | Physical Environment  | Climate Change | Clean & Renewable Energy |                  |
| CTEC   | Global X CleanTech ETF                         | \$79.27        | \$99.44        | -\$3.14         | Physical Environment  | Climate Change | CleanTech                |                  |
| QCLN   | First Trust Nasdaq Clean Edge Green Energy ETF | \$1,394.66     | \$1,686.02     | -\$75.47        | Physical Environment  | Climate Change | CleanTech                |                  |
| ERTH   | Invesco Cleantech ETF                          | \$269.58       | \$293.91       | \$0.00          | Physical Environment  | Climate Change | CleanTech                |                  |
| CTEX   | ProShares S&P Kensho Cleantech ETF             | \$5.76         | \$6.63         | \$0.00          | Physical Environment  | Climate Change | CleanTech                |                  |
| SOLR   | Sustainable Energy II ETF                      | \$5.11         | \$5.63         | \$0.00          | Physical Environment  | Climate Change | CleanTech                |                  |
| GBLD   | Invesco MSCI Green Building ETF                | \$6.70         | \$6.92         | \$0.00          | Physical Environment  | Climate Change | Green Building           |                  |
| GRNR   | Global X Green Building ETF                    | \$2.19         | \$2.24         | \$0.00          | Physical Environment  | Climate Change | Green Building           |                  |
| KROP   | Global X AgTech & Food Innovation ETF          | \$5.02         | \$5.61         | \$0.00          | Physical Environment  | Climate Change | Resource Scarcity        | Sustainable Food |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name   | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category             | Mega-Theme           | Theme             | Sub-Theme        |
|--------|--|----------------|----------------|-----------------|----------------------|----------------------|-------------------|------------------|
| YUMY   | VanEck Future of Food ETF                            | \$3.34         | \$3.54         | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity | Sustainable Food |
| EATV   | VegTech Plant-based Innovt & Clmt ETF                | \$5.68         | \$5.26         | \$0.49          | Physical Environment | Climate Change       | Resource Scarcity | Sustainable Food |
| IVEG   | iShares Emergent Food and AgTech Mult ETF            | \$5.89         | \$6.20         | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity | Sustainable Food |
| EVX    | Environmental Services ETF                           | \$85.23        | \$85.77        | \$3.07          | Physical Environment | Climate Change       | Resource Scarcity | Waste/Recycling  |
| AQWA   | Global X Clean Water ETF                             | \$9.32         | \$9.04         | \$0.61          | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| EBLU   | Ecofin Global Water ESG Fund                         | \$49.08        | \$50.84        | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| PHO    | Invesco Water Resources ETF                          | \$1,902.12     | \$1,923.52     | \$3.45          | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| CGW    | Invesco S&P Global Water Index ETF                   | \$956.80       | \$1,013.84     | -\$8.09         | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| FIW    | First Trust Water ETF                                | \$1,443.61     | \$1,465.26     | \$13.55         | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| PIO    | Invesco Global Water ETF                             | \$269.57       | \$275.61       | -\$1.85         | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| IWTR   | iShares MSCI Water Management Multisector ETF        | \$5.60         | \$5.88         | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity | Water            |
| OCEN   | IQ Clean Oceans ETF                                  | \$4.61         | \$4.93         | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity |                  |
| CIRC   | JPMorgan Sustainable Consumption ETF                 | \$11.69        | \$12.16        | \$0.00          | Physical Environment | Climate Change       | Resource Scarcity |                  |
| CCSO   | Carbon Collective Climate Solutions U.S. Equity ETF  | \$21.25        | \$22.38        | \$0.48          | Physical Environment | Climate Change       |                   |                  |
| ETEC   | iShares Breakthrough Environmental Solutions ETF     | \$3.90         | \$4.35         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| NVIR   | Horizon Kinetics Energy Remediation ETF              | \$2.75         | \$2.71         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| NZRO   | Strategy Shares Halt Climate Change ETF              | \$1.10         | \$1.15         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| GCLN   | Goldman Sachs Bloomberg Cln Enrgy Eq ETF             | \$8.76         | \$9.61         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| KGRN   | KraneShares MSCI China Environment ETF               | \$82.52        | \$98.18        | -\$1.37         | Physical Environment | Climate Change       |                   |                  |
| GSFP   | Goldman Sachs Future Planet Equity ETF               | \$142.47       | \$155.15       | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| BECO   | BlackRock Future Climate and Sustainable Economy ETF | \$4.21         | \$4.42         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| ENRG   | SoFi Smart Energy ETF                                | \$1.98         | \$2.48         | -\$0.14         | Physical Environment | Climate Change       |                   |                  |
| TEMP   | JPMorgan Climate Change Solutions ETF                | \$21.69        | \$22.92        | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| NBCT   | Neuberger Berman Crbn Trnstn & Infrs ETF             | \$25.41        | \$26.66        | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| RNEW   | VanEck Green Infrastructure ETF                      | \$1.91         | \$2.08         | \$0.00          | Physical Environment | Climate Change       |                   |                  |
| CLIA   | Veridien Climate Action ETF                          | \$12.32        | \$2.74         | \$9.52          | Physical Environment | Climate Change       |                   |                  |
| UPGR   | Xtrackers US Green Infrastructure Select Equity ETF  | \$5.14         | \$2.74         | \$0.03          | Physical Environment | Climate Change       |                   |                  |
| DMAT   | Global X Disruptive Materials ETF                    | \$4.89         | \$5.54         | \$0.00          | Physical Environment | Disruptive Materials |                   |                  |
| REMX   | VanEck Vectors Rare Earth/Strategic Metals ETF       | \$518.64       | \$598.06       | \$0.70          | Physical Environment | Disruptive Materials |                   |                  |
| GMET   | VanEck Green Metals ETF                              | \$25.60        | \$25.93        | \$2.60          | Physical Environment | Disruptive Materials |                   |                  |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

## Appendix – Classification of Thematic ETFs

| Ticker | Name  | Aug 2023 (\$M) | Jul 2023 (\$M) | MoM Flows (\$M) | Category             | Mega-Theme                 | Theme | Sub-Theme |
|--------|---|----------------|----------------|-----------------|----------------------|----------------------------|-------|-----------|
| TINT   | ProShares Smart Materials ETF                       | \$1.64         | \$1.73         | \$0.00          | Physical Environment | Disruptive Materials       |       |           |
| CRIT   | Optica Rare Earths & Critical Materials ETF         | \$2.25         | \$2.49         | \$0.00          | Physical Environment | Disruptive Materials       |       |           |
| ION    | ProShares S&P Global Cor Btty Mtls ETF              | \$2.58         | \$2.88         | \$0.00          | Physical Environment | Disruptive Materials       |       |           |
| SETM   | Sprott Energy Transition Materials ETF              | \$10.54        | \$8.77         | \$1.95          | Physical Environment | Disruptive Materials       |       |           |
| NIKL   | Sprott Nickel Miners ETF                            | \$1.61         | \$1.73         | \$0.00          | Physical Environment | Disruptive Materials       |       |           |
| PAVE   | Global X U.S. Infrastructure Development ETF        | \$5,303.15     | \$5,085.95     | \$244.09        | Physical Environment | Infrastructure Development |       |           |
| IFRA   | iShares U.S. Infrastructure ETF                     | \$2,149.88     | \$2,152.72     | \$71.92         | Physical Environment | Infrastructure Development |       |           |
| AIRR   | First Trust RBA American Industrial Renaissance ETF | \$493.04       | \$463.20       | \$27.20         | Physical Environment | Infrastructure Development |       |           |
| OBOR   | KraneShares MSCI One Belt One Road ETF              | \$4.26         | \$4.56         | \$0.00          | Physical Environment | Infrastructure Development |       |           |
| SUPL   | ProShares Supply Chain Logistics ETF                | \$1.98         | \$2.09         | \$0.00          | Physical Environment | Infrastructure Development |       |           |
| SHPP   | Pacer Industrial and Logistics ETF                  | \$1.04         | \$1.10         | \$0.00          | Physical Environment | Infrastructure Development |       |           |
| RBLD   | First Trust Alerian US NextGen Infrastructure ETF   | \$8.03         | \$8.22         | \$0.00          | Physical Environment | Infrastructure Development |       |           |
| EFRA   | iShares Environmental Infrac & IndustrETF           | \$4.44         | \$4.66         | \$0.00          | Physical Environment | Infrastructure Development |       |           |
| RSHO   | Tema American Reshoring ETF                         | \$10.53        | \$8.84         | \$1.75          | Physical Environment | Infrastructure Development |       |           |
| BLLD   | JPMorgan Sustainable Infrastructure ETF             | \$24.25        | \$25.40        | \$0.00          | Physical Environment |                            |       |           |

Source: Global X ETFs, Bloomberg. August 2023 as of 08/31/2023; July 2023 as of 07/31/2023.

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