

GLOBAL X

by Mirae Asset



European Thematic ETFs Report

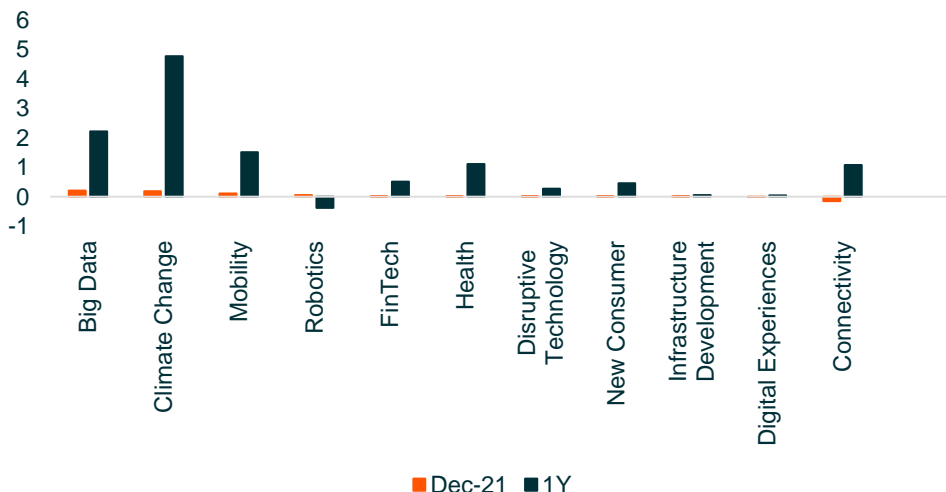
December 2021



European Thematic UCITS ETFs Flow

- In December, UCITS Thematic ETFs recorded US\$446m of net inflows, after attracting US\$823m in November
- Big Data themes attracted the largest net inflows this month (US\$210m), with the bulk of net new inflows going into cybersecurity themes (US\$134m), following the approval of US\$1bn of Cyber funds as part of US\$1.2tn infrastructure package to fund state and local cybersecurity efforts
- Climate change themes continued to attract large net inflows (US\$187m), led by resource scarcity themes (US\$228m). However, the clean & renewable energy themes saw US\$59m in outflows on the month, possibly impacted by the failure to pass Biden’s Build Back Better (BBB) plan in the US which contained some US\$555bn in clean energy investments
- Electric Vehicles (EV) theme also continued to benefit from an increased investors’ interest for sustainably-themes garnering US\$66m of net inflows this month
- Connectivity theme saw the largest net outflows this month (US\$148m), led by outflows in Emerging Markets Internet (US\$128) possibly reflecting the adverse effect from the Biden administration adding more Chinese companies to the US trade restriction list, so-called Entity List.

Top Mega Themes by monthly flows (US\$bn)



Top/Bottom 5 UCITS Thematic ETFs by monthly flows

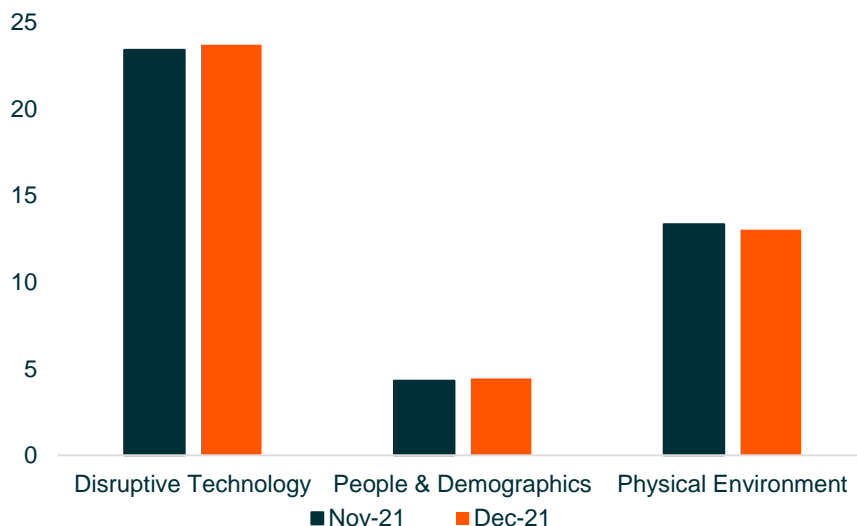
Funds	Dec-2021 (US\$m)
iShares Global Water UCITS ETF	178
iShares Automation & Robotics UCITS ETF	79.7
L&G Cyber Security UCITS ETF	57.1
Lyxor MSCI Future Mobility ESG DR UCITS ETF	49
iShares Ageing Population UCITS ETF	46
KraneShares CSI China Internet UCITS ETF	-128.2
iShares Global Clean Energy UCITS ETF	-59.7
Lyxor MSCI Disruptive Tech ESG DR UCITS ETF	-36
Amundi Smart Factory UCITS ETF	-26.9
Amundi Smart City UCITS ETF	-25.8

Source: Bloomberg. As of December 31, 2021.

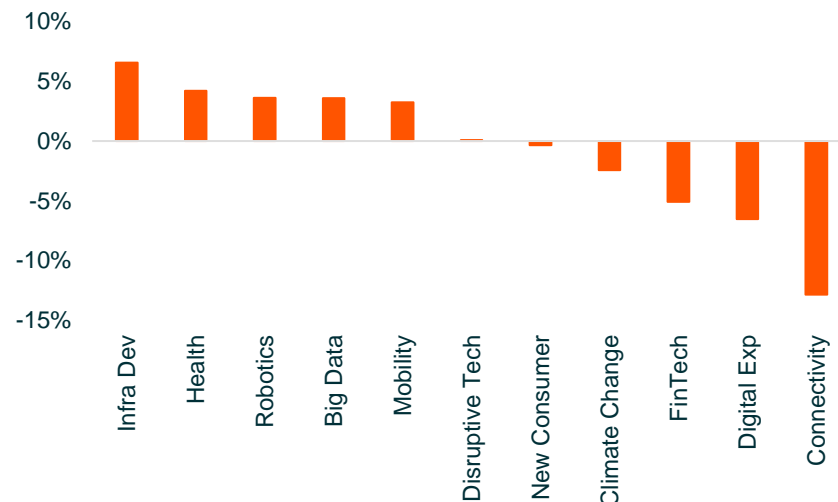


European Thematic UCITS ETFs AUM

Categories (AUM, US\$bn)



Mega Themes by AUM growth (monthly % chg.)



Top 5 UCITS Thematic ETFs by AUM growth

Funds	AUM (monthly % chg.)
Procore Space UCITS ETF	16%
Global X Cloud Computing Ucits	15%
VanEck Vectors Rare Earth and Strat Metals UCITS ETF	13%
L&G Digital Payments UCITS ETF	13%
Amundi STOXX Global Artificial Intelligence UCITS ETF	12%

Bottom 5 UCITS Thematic ETFs by AUM growth

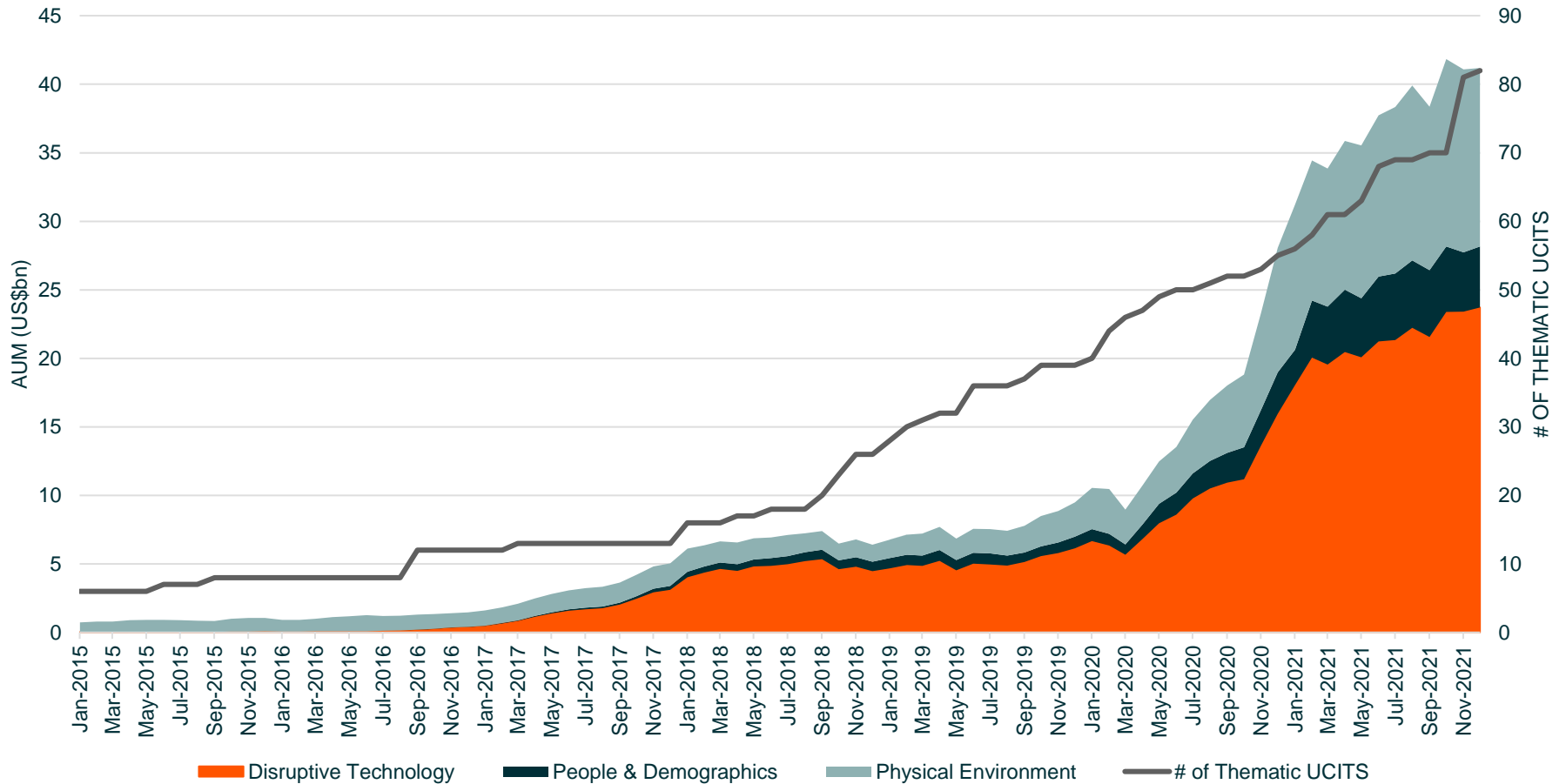
Funds	AUM (monthly % chg.)
Amundi Smart City UCITS ETF	-37%
Amundi Smart Factory UCITS ETF	-33%
KraneShares CSI China Internet UCITS ETF	-22%
L&G Clean Energy UCITS ETF	-16%
Lyxor MSCI Disruptive Tech. ESG UCITS ETF	-13%

Source: Bloomberg. As of December 30, 2021. UCITS Thematic ETFs with minimal AUM of US\$10m as of the beginning of the previous month and excludes fund closures.



European Thematic UCITS ETFs AUM

At the end of December 2021, there were 82 thematic UCITS ETFs totalling US\$41.2bn in assets under management (AUM). Themes related to People & Demographics and Disruptive Technology saw an increase in AUMs of 2.7% and 1.3%, respectively. However, physical environment themes saw a slight decline in AUMs (-2.4%) led by Climate Change-related themes.



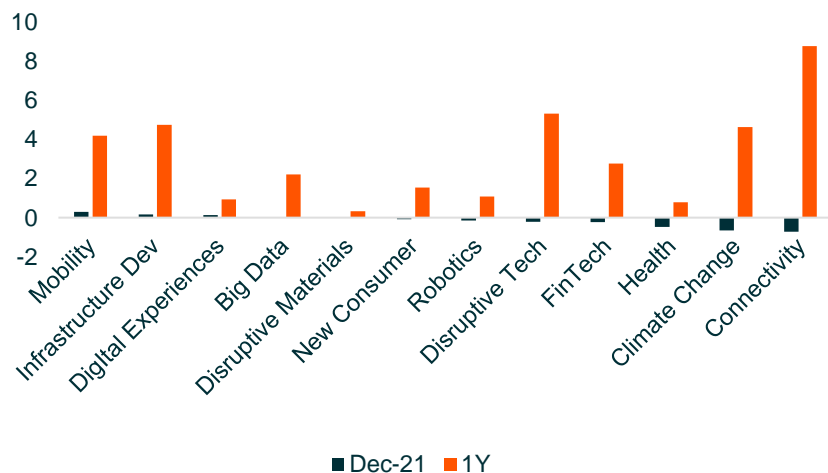
Source: Bloomberg. As of December 30, 2021.



US Thematic ETFs Flow

- In December, US Thematic ETFs recorded US\$1.9bn of net outflows, led by Connectivity themes (US\$714m) and Climate Change-related themes (US\$651m)
- Mobility themes recorded the largest net inflows once again (US\$293m) this month, with Electric Vehicle (EV) theme attracting the bulk of the monthly flows
- The Infrastructure development theme also recorded US\$170m of net inflows on the month, as investors might favour cyclical sector exposures like Industrials and Materials amid the rising yields backdrop.

Top Mega Themes by monthly flows (US\$bn)



Top/Bottom 5 Thematic ETFs by monthly flows

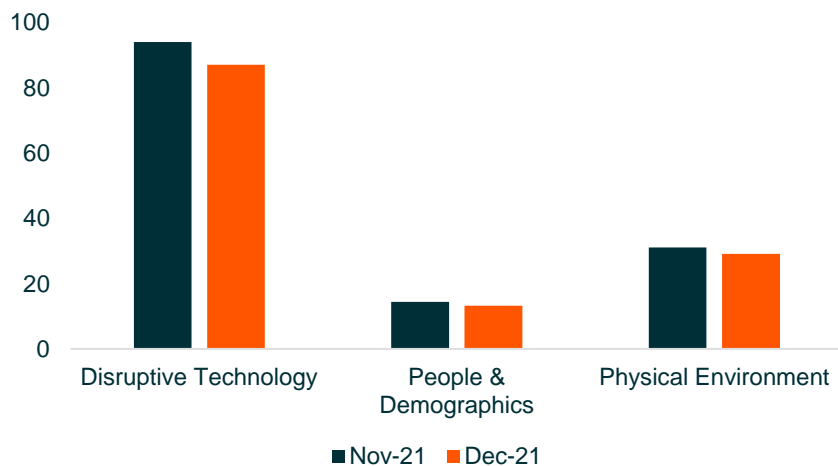
Funds	Dec-2021 (US\$m)
First Trust NASDAQ Cybersecurity ETF	178.0
Roundhill Ball Metaverse ETF	172.1
Global X Lithium & Battery Tech ETF	114.1
Global X U.S. Infrastructure Development ETF	104.1
Global X Autonomous & Electric Vehicles ETF	99.7
KraneShares CSI China Internet ETF	- 478.8
Invesco Solar ETF	- 416.7
ARK Innovation ETF	- 341.5
Genomic Revolution ETF	- 288.3
Fintech Innovation ETF	- 283.1

Source: Bloomberg. As of December 31, 2021.

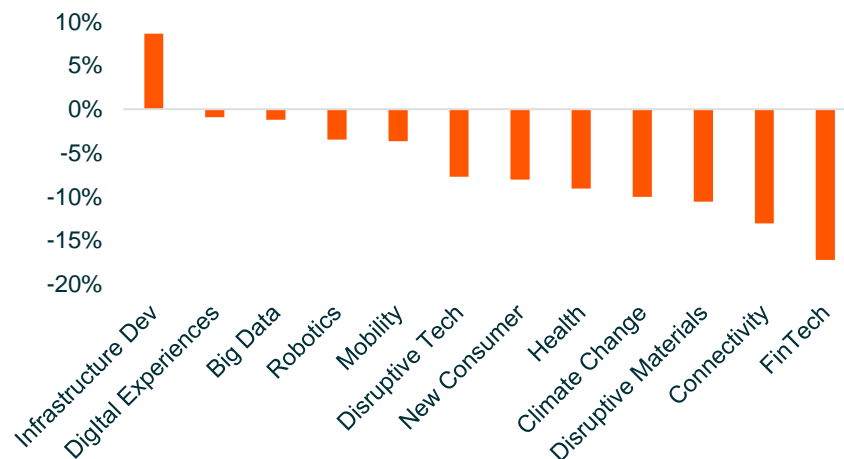


US Thematic ETFs AUM

Categories (AUM, US\$bn)



Mega Themes by AUM growth (monthly % chg.)



Top 5 Thematic ETFs by AUM growth

Funds	AUM (monthly % chg.)
Goldman Sachs Future Health Care EQ ETF	20%
Amplify Thematic All-Stars ETF	19%
AdvisorShares Gerber Kawasaki ETF	18%
iShares U.S. Infrastructure ETF	16%
Roundhill Ball Metaverse ETF	15%

Bottom 5 Thematic ETFs by AUM growth

Funds	AUM (monthly % chg.)
Global X Telemedicine & Digital Health ETF	-37%
Viridi Cleaner Energy Crypto-Mining & Semi ETF	-36%
Amplify Transformational Data Sharing ETF	-30%
Global X CleanTech ETF	-29%
VanEck Vectors Digital Transformation ETF	-27%

Source: Bloomberg. As of December 31, 2021. US Thematic ETFs with minimal AUM of US\$10m as of the beginning of the previous month and excludes fund closures.



Disruptive Trends

Category	Description
Disruptive Technology	<ul style="list-style-type: none"> • Connectivity (IoT) drives the digitisation of the economy and enables new disruptive technologies that are profoundly changing the way we live and work • Digitisation is changing business models and empowers companies to modernise in order to meet the new demand • The Digital Economy generated almost half of value added and half of the new employment in G20 economies between 2006 and 2017, according to OECD estimates
People & Demographics	<ul style="list-style-type: none"> • Millennials' increased wealth from peak working years and inheritance makes them targeted consumer demographic • Rising middle-class consumers in Emerging Markets • Urbanisation and on-demand purchasing favour E-commerce retail channels and next generation products and services • Heightened focus on longevity and quality of life, coupled with rising health care costs are driving people to engage in physical activity, healthy eating, and embrace health technologies • Desire for personalised medicine is giving rise to genomics, while efforts to improve convenience, patient outcomes, cost efficiency are driving towards telemedicine and digital health
Physical Environment	<ul style="list-style-type: none"> • 2020 was one of the hottest years on record • Over 75% of warming comes from carbon dioxide emissions (CO2) and humans are responsible for a 47% increase of such emissions since the start of the industrial revolution • Since 2020, most of advanced and developing nations have renewed their commitments to transition to a carbon neutral global economy by 2030-2050 • Clean technologies are essential to making carbon neutrality a reality • Falling costs and rising production of lithium-ion batteries catalyses shift to renewable energy and electric vehicles

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 materialisation 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 materialise 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 recognise 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 organise 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.

Thematic ETF Landscape

Global X's classification system establishes a consistent framework for identifying and categorising the growing thematic ETF space.

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

Source: Global X ETFs As of December 31, 2021.

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For more research please visit:

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