



# ETF Category Report

## Equity: Thematic - Sustainability

As of 12/29/2023

The ETF Action Category Reports present category averages, category breakdown, and ETF level data using the ETF Action Classification System. For more information, please reach out to [team@etfaction.com](mailto:team@etfaction.com). Category reports include data relating to:

Flows & Product Growth

Structure

Performance

Risk

Composition

Fundamentals

This report is currently in beta so if you have any questions or see any issues, please send a message to [team@etfaction.com](mailto:team@etfaction.com).

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# Flows & Category Growth

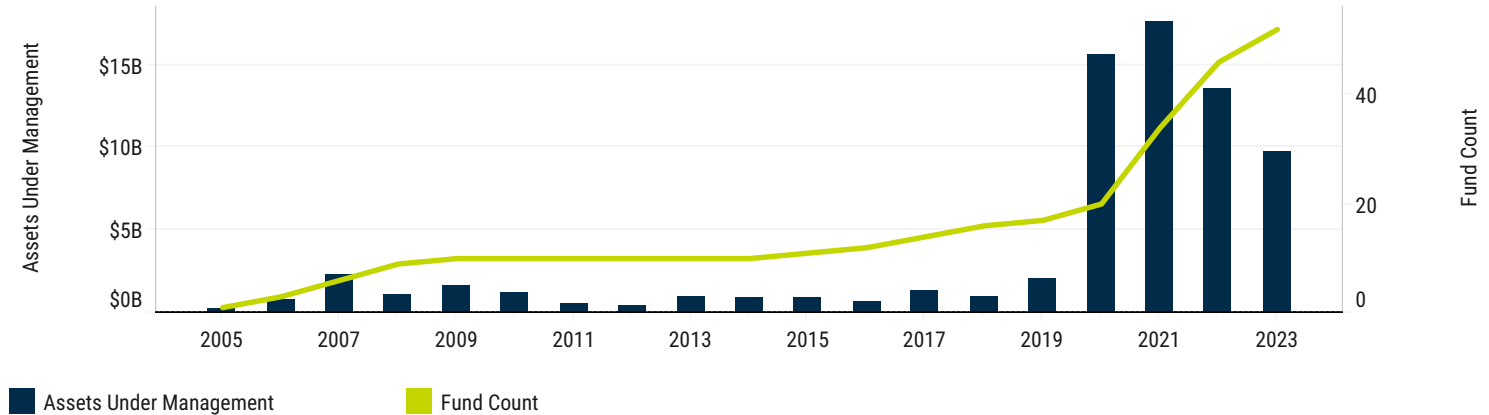


## Category: Equity: Thematic - Sustainability

As of 12/29/2023

Fund Count	Assets Under Management	1 Month Flows	3 Month Flows	Year To Date Flows	1 Year Flows	3 Year Flows	5 Year Flows
52	\$9.7B	\$0.17B	(\$0.61B)	\$0.00B	(\$2.01B)	\$3.60B	\$12.05B

### Category Growth



### Top 10 Funds by 1 Month Flows

Ticker	Name	Inception	AUM	1 Month	3 Month	Year To Date	1 Year	3 Year	5 Year
TAN	Invesco Solar ETF	4/15/2008	\$1,781.41M	\$222.6M	\$234.6M	\$0.0M	(\$84.1M)	\$100.5M	\$1,550.6M
ICLN	iShares Global Clean Energy ETF	6/24/2008	\$3,097.73M	\$29.5M	(\$233.7M)	\$0.0M	(\$1,043.1M)	\$1,798.9M	\$4,515.3M
CNRG	SPDR S&P Kensho Clean Power ETF	10/22/2018	\$263.92M	\$1.4M	(\$14.3M)	\$0.0M	(\$24.3M)	\$230.9M	\$374.6M
CCSO	Carbon Collective Climate Solutions U.S. Equity ..	9/19/2022	\$23.10M	\$1.0M	\$1.4M	\$0.0M	\$5.6M	\$21.8M	\$21.8M
CLIA	Veridien Climate Action ETF	5/8/2023	\$25.37M	\$0.5M	\$1.3M	\$0.0M	\$23.9M	\$23.9M	\$23.9M
RAYS	Global X Solar ETF	9/8/2021	\$7.19M	\$0.4M	\$0.4M	\$0.0M	\$4.7M	\$10.5M	\$10.5M
EATV	VegTech Plant-based Innovation & Climate ETF	12/28/2021	\$5.60M	\$0.2M	\$0.2M	\$0.0M	\$0.7M	\$7.1M	\$7.1M
KSEA	KraneShares Rockefeller Ocean Engagement ETF	9/12/2023	\$2.64M	\$0.0M	\$0.0M	\$0.0M	\$2.5M	\$2.5M	\$2.5M
BECO	BlackRock Future Climate and Sustainable Econ..	8/3/2021	\$4.24M	\$0.0M	\$0.0M	\$0.0M	\$0.0M	\$0.0M	\$0.0M
BLLD	JPMorgan Sustainable Infrastructure ETF	9/8/2022	\$25.81M	\$0.0M	\$0.0M	\$0.0M	\$14.0M	\$23.4M	\$23.4M

### Bottom 10 Funds by 1 Month Flows

Ticker	Name	Inception	AUM	1 Month	3 Month	Year To Date	1 Year	3 Year	5 Year
GRID	First Trust Nasdaq Clean Edge Smart GRID Infra..	11/17/2009	\$817.95M	(\$19.4M)	(\$273.9M)	\$0.0M	\$91.3M	\$634.9M	\$710.4M
QCLN	First Trust Nasdaq Clean Edge Green Energy Ind..	2/8/2007	\$1,159.65M	(\$15.2M)	(\$65.6M)	\$0.0M	(\$289.4M)	\$400.4M	\$1,580.6M
ACES	ALPS Clean Energy ETF	6/29/2018	\$302.70M	(\$9.1M)	(\$58.1M)	\$0.0M	(\$162.2M)	\$120.2M	\$535.6M
ERTH	Invesco MSCI Sustainable Future ETF	10/24/2006	\$233.62M	(\$8.8M)	(\$23.8M)	\$0.0M	(\$67.4M)	(\$43.2M)	\$93.1M
SDG	iShares MSCI Global Sustainable Development ..	4/20/2016	\$354.03M	(\$7.8M)	(\$29.5M)	\$0.0M	(\$84.7M)	\$127.8M	\$322.0M
EVX	VanEck Environmental Services ETF	10/10/2006	\$75.18M	(\$7.7M)	(\$7.7M)	\$0.0M	(\$3.6M)	\$20.4M	\$31.9M
PBW	Invesco WilderHill Clean Energy ETF	3/3/2005	\$487.76M	(\$4.3M)	(\$0.1M)	\$0.0M	(\$145.4M)	(\$357.1M)	\$1,190.5M
KGRN	KraneShares MSCI China Clean Technology Inde..	10/13/2017	\$66.70M	(\$2.2M)	(\$4.6M)	\$0.0M	(\$9.7M)	\$105.1M	\$150.0M
GSFP	Goldman Sachs Future Planet Equity ETF	7/13/2021	\$45.27M	(\$2.2M)	(\$85.6M)	\$0.0M	(\$110.4M)	\$93.0M	\$93.0M
CTEC	Global X CleanTech ETF	10/27/2020	\$63.17M	(\$2.1M)	(\$4.0M)	\$0.0M	(\$28.8M)	\$122.2M	\$165.4M

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# Overview & Structure



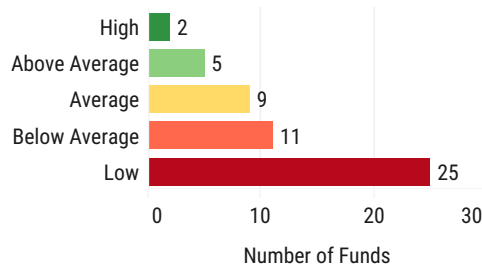
## Category: Equity: Thematic - Sustainability

As of 12/29/2023

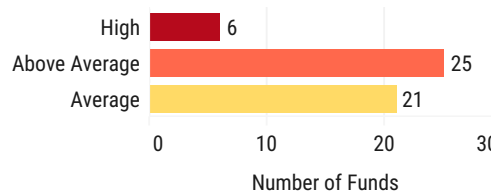
Fund Count	Assets Under Management	Average Expense Ratio	Average Lifespan	Average TTM Yield	Average Spread (%)	Average ADV (\$)
52	\$9.7B	0.60%	4.79 Years	1.42%	0.40%	\$3.01M

## Breakdown of Category Universe Ratings

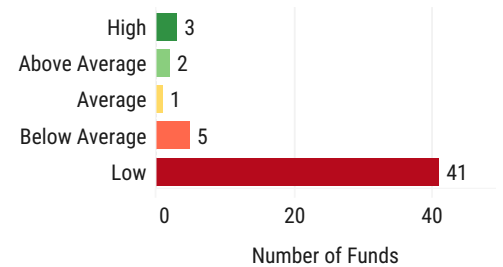
### Assets Under Management



### Expense Ratio



### Liquidity



## Top 10 Funds by Greatest Assets Under Management

Ticker	Name	Inception	AUM	Expense Ratio	Distribution Yield (TTM)	Average Spread	ADV
ICLN	iShares Global Clean Energy ETF	6/24/2008	\$3,097.73M	0.41%	1.58%	0.07%	\$53.71M
TAN	Invesco Solar ETF	4/15/2008	\$1,781.41M	0.67%	0.09%	0.12%	\$62.87M
QCLN	First Trust Nasdaq Clean Edge Green Energy Index Fund	2/8/2007	\$1,159.65M	0.58%	0.74%	0.10%	\$10.79M
GRID	First Trust Nasdaq Clean Edge Smart GRID Infrastructure L.	11/17/2009	\$817.95M	0.58%	0.89%	0.10%	\$9.09M
PBW	Invesco WilderHill Clean Energy ETF	3/3/2005	\$487.76M	0.66%	3.58%	0.16%	\$8.35M
SDG	iShares MSCI Global Sustainable Development Goals ETF	4/20/2016	\$354.03M	0.49%	1.77%	0.18%	\$1.16M
ACES	ALPS Clean Energy ETF	6/29/2018	\$302.70M	0.55%	1.42%	0.26%	\$4.24M
CNRG	SPDR S&P Kensho Clean Power ETF	10/22/2018	\$263.92M	0.45%	1.15%	0.14%	\$1.52M
ERTH	Invesco MSCI Sustainable Future ETF	10/24/2006	\$233.62M	0.62%	0.95%	0.26%	\$0.77M
FAN	First Trust Global Wind Energy ETF	6/16/2008	\$218.67M	0.60%	1.48%	0.21%	\$0.82M

## Top 10 Funds by Lowest Expense Ratio

Ticker	Name	Inception	AUM	Expense Ratio	Distribution Yield (TTM)	Average Spread	ADV
CCSO	Carbon Collective Climate Solutions U.S. Equity ETF	9/19/2022	\$23.10M	0.35%	0.80%	0.44%	\$0.06M
UPGR	Xtrackers US Green Infrastructure Select Equity ETF	7/12/2023	\$4.86M	0.35%	0.00%	0.10%	\$0.00M
FRNW	Fidelity Clean Energy ETF	10/5/2021	\$31.33M	0.39%	1.30%	0.49%	\$0.13M
GBLD	Invesco MSCI Green Building ETF	4/22/2021	\$6.15M	0.39%	6.69%	0.49%	\$0.03M
ICLN	iShares Global Clean Energy ETF	6/24/2008	\$3,097.73M	0.41%	1.58%	0.07%	\$53.71M
CNRG	SPDR S&P Kensho Clean Power ETF	10/22/2018	\$263.92M	0.45%	1.15%	0.14%	\$1.52M
GCLN	Goldman Sachs Bloomberg Clean Energy Equity ETF	2/8/2022	\$11.99M	0.45%	1.65%	0.67%	\$0.10M
GRNR	Global X Green Building ETF	4/11/2022	\$2.36M	0.45%	2.95%	0.48%	\$0.01M
OCEN	IQ Clean Oceans ETF	10/21/2021	\$5.05M	0.45%	0.14%	0.27%	\$0.00M
RNEW	VanEck Green Infrastructure ETF	10/18/2022	\$1.88M	0.45%	0.85%	0.16%	\$0.00M

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# Category Performance



## Category: Equity: Thematic - Sustainability

As of 12/29/2023

Fund Count	Average 1 Month Return	Average 3 Month Return	Average YTD Return	Average 1 Year Return	Average 3 Year Return**	Average 5 Year Return**	Average 10 Year Return**
52	6.62%	7.14%	0.00%	-3.45%	-4.15%	4.05%	1.34%

\*\*Annualized

## Breakdown of Category Performance

### 1 Month Returns



**Advancers\*** **Top 1 Month Return**

51 12.57%

**Decliners\*** **Bottom 1 Month Return**

1 -2.67%

### Top 10 Performers: 1 Month

Ticker	Name	Inception	AUM	1 Month	3 Month	YTD	1 Year	3 Year*	5 Year*
CTEX	ProShares S&P Kensho Cleantech ETF	9/29/2021	\$5.55M	12.57%	7.46%	0.00%	-10.25%		
TAN	Invesco Solar ETF	4/15/2008	\$1,781.41M	11.55%	3.11%	0.00%	-26.79%	-19.61%	23.65%
ENRG	SoFi Smart Energy ETF	7/20/2021	\$1.91M	11.35%	7.39%	0.00%	-8.35%		
QCLN	First Trust Nasdaq Clean Edge Green Energy Index Fund	2/8/2007	\$1,159.65M	11.13%	-0.89%	0.00%	-10.03%	-15.37%	19.70%
ACES	ALPS Clean Energy ETF	6/29/2018	\$302.70M	10.06%	-1.34%	0.00%	-20.04%	-22.76%	10.94%
RAYS	Global X Solar ETF	9/8/2021	\$7.19M	9.80%	-2.07%	0.00%	-35.13%		
FRNW	Fidelity Clean Energy ETF	10/5/2021	\$31.33M	9.63%	8.85%	0.00%	-19.63%		
CLIA	Veridien Climate Action ETF	5/8/2023	\$25.37M	8.80%	9.39%				
UPGR	Xtrackers US Green Infrastructure Select Equity ETF	7/12/2023	\$4.86M	8.75%	5.04%				
GBLD	Invesco MSCI Green Building ETF	4/22/2021	\$6.15M	8.65%	17.39%	0.00%	6.39%		

### Bottom 10 Performers: 1 Month

Ticker	Name	Inception	AUM	1 Month	3 Month	YTD	1 Year	3 Year*	5 Year*
DKRB	Subversive Decarbonization ETF	12/22/2022	\$0.59M	-2.67%	-5.31%	0.00%	-0.57%		
ECLN	First Trust EIP Carbon Impact ETF	8/19/2019	\$30.36M	0.81%	7.67%	0.00%	-3.38%	4.52%	
KGRN	KraneShares MSCI China Clean Technology Index ETF	10/13/2017	\$66.70M	2.46%	-6.90%	0.00%	-14.74%	-18.69%	7.55%
GCLN	Goldman Sachs Bloomberg Clean Energy Equity ETF	2/8/2022	\$11.99M	3.08%	7.15%	0.00%	-4.18%		
INFR	ClearBridge Sustainable Infrastructure ETF	12/14/2022	\$8.65M	3.45%	13.50%	0.00%	5.24%		
YUMY	VanEck Future of Food ETF	11/30/2021	\$3.26M	3.68%	5.69%	0.00%	-7.86%		
EVX	VanEck Environmental Services ETF	10/10/2006	\$75.18M	3.84%	7.38%	0.00%	12.98%	8.81%	13.40%
KROP	Global X AgTech & Food Innovation ETF	7/12/2021	\$4.71M	3.98%	-0.87%	0.00%	-23.87%		
BLLD	JPMorgan Sustainable Infrastructure ETF	9/8/2022	\$25.81M	4.01%	15.06%	0.00%	8.87%		
EATV	VegTech Plant-based Innovation & Climate ETF	12/28/2021	\$5.60M	4.45%	4.58%	0.00%	0.73%		

\*Funds must have at least one month track record to be included in performance statistics.

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# 3 Year Risk Metrics Vs. S&P 500 (SPY)



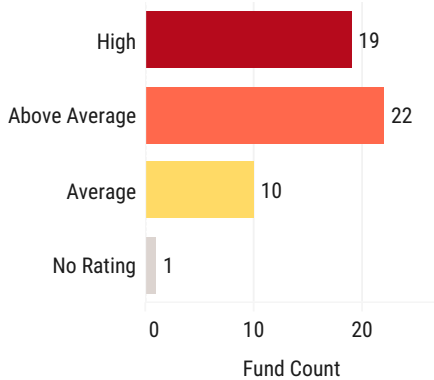
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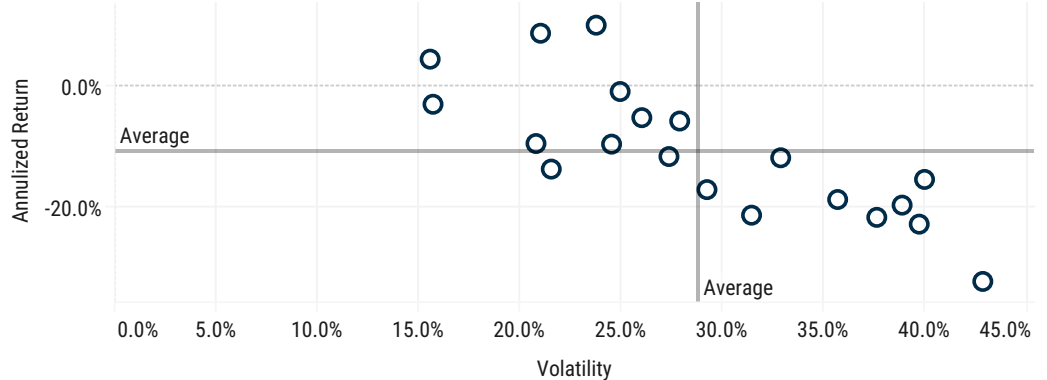
Fund Count	Average Return	Average Volatility	Average Correlation	Average Sharpe Ratio	Average Sortino Ratio	Average Beta	Average Alpha	Average Up Capture	Average Down Capture
52	-10.78%	28.83%	0.69	-0.35	-0.71	1.09	-19.70%	62.99%	146.69%

## Breakdown of Category Risk

### Category Breakdown: Volatility Ratings



### 3 Year Risk-Return Scatterplot



## Top 10 Funds by Sharpe Ratio (3 Year)

Ticker	Name	AUM	Annualized Return	Volatility	Correlation (SPY)	Sharpe Ratio	Beta	Alpha	Up Capture	Down Capture	Volatility Rating (0-5)
GRID	First Trust Nasdaq Clean Edge Smart GRI..	\$817.9M	10.1%	23.7%	93.5%	0.41	1.26	-1.5%	122.6%	130.1%	3.27
EVX	VanEck Environmental Services ETF	\$75.2M	8.8%	21.0%	86.6%	0.40	1.03	-0.8%	98.5%	102.8%	3.10
ECLN	First Trust EIP Carbon Impact ETF	\$30.4M	4.5%	15.5%	78.9%	0.29	0.70	-2.1%	62.6%	71.0%	2.34
SOLR	Guinness Atkinson Funds SmartETFs Sust..	\$5.1M	-0.8%	24.9%	80.2%	-0.03	1.14	-10.4%	92.4%	136.5%	3.69
SDG	iShares MSCI Global Sustainable Develop..	\$354.0M	-2.9%	15.7%	74.9%	-0.19	0.67	-9.2%	51.7%	89.8%	2.62
SIMS	SPDR S&P Kensho Intelligent Structures E..	\$19.9M	-5.2%	26.0%	88.9%	-0.20	1.31	-16.5%	93.7%	158.4%	3.98
BNE	Blue Horizon BNE ETF	\$5.3M	-5.7%	27.9%	74.7%	-0.21	1.18	-15.1%	81.0%	143.7%	3.96
CNRG	SPDR S&P Kensho Clean Power ETF	\$263.9M	-11.8%	32.8%	57.3%	-0.38	1.07	-19.1%	48.8%	129.3%	4.65
ERTH	Invesco MSCI Sustainable Future ETF	\$233.6M	-9.5%	24.5%	76.4%	-0.41	1.06	-18.8%	70.3%	147.7%	3.88
QCLN	First Trust Nasdaq Clean Edge Green Ener..	\$1,159.7M	-15.4%	39.9%	60.6%	-0.41	1.38	-23.9%	73.8%	182.1%	5.00

## Least Volatile 10 Funds by Volatility Rating

Ticker	Name	AUM	Annualized Return	Volatility	Correlation (SPY)	Sharpe Ratio	Beta	Alpha	Up Capture	Down Capture	Volatility Rating (0-5)
ECLN	First Trust EIP Carbon Impact ETF	\$30.4M	4.5%	15.5%	78.9%	0.29	0.70	-2.1%	62.6%	71.0%	2.34
SDG	iShares MSCI Global Sustainable Develop..	\$354.0M	-2.9%	15.7%	74.9%	-0.19	0.67	-9.2%	51.7%	89.8%	2.62
EVX	VanEck Environmental Services ETF	\$75.2M	8.8%	21.0%	86.6%	0.40	1.03	-0.8%	98.5%	102.8%	3.10
GRID	First Trust Nasdaq Clean Edge Smart GRID..	\$817.9M	10.1%	23.7%	93.5%	0.41	1.26	-1.5%	122.6%	130.1%	3.27
FAN	First Trust Global Wind Energy ETF	\$218.7M	-9.4%	20.8%	75.3%	-0.47	0.89	-17.6%	51.1%	120.6%	3.48
SOLR	Guinness Atkinson Funds SmartETFs Sust..	\$5.1M	-0.8%	24.9%	80.2%	-0.03	1.14	-10.4%	92.4%	136.5%	3.69
RNRG	Global X Renewable Energy Producers ETF	\$49.6M	-13.6%	21.5%	73.2%	-0.68	0.90	-22.2%	43.8%	132.0%	3.86
ERTH	Invesco MSCI Sustainable Future ETF	\$233.6M	-9.5%	24.5%	76.4%	-0.41	1.06	-18.8%	70.3%	147.7%	3.88
SMOG	VanEck Low Carbon Energy ETF	\$165.5M	-11.6%	27.3%	71.2%	-0.45	1.11	-20.8%	64.1%	149.4%	3.95
BNE	Blue Horizon BNE ETF	\$5.3M	-5.7%	27.9%	74.7%	-0.21	1.18	-15.1%	81.0%	143.7%	3.96

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# Equity Composition



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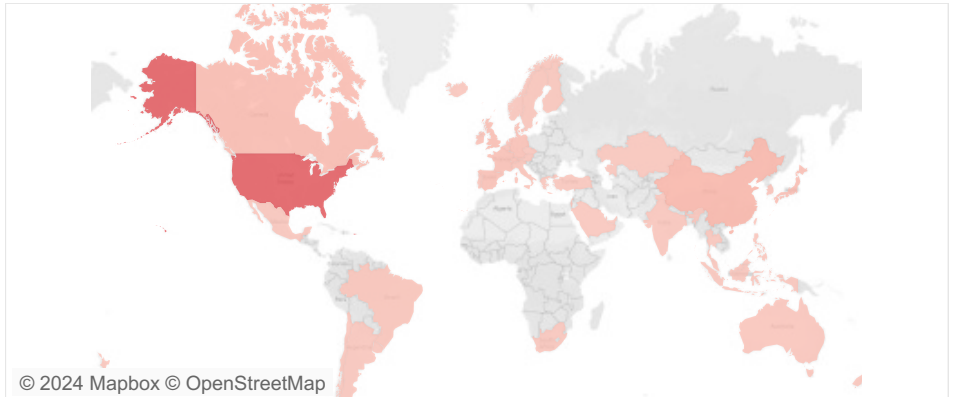
As of 12/29/2023

Fund Count*	Assets Under Management	Average Top 10 Holdings Weight	Average Weighted Avg Market Cap	Average Sector Concentration	Average Stock Concentration
51	\$9.7B	44.28%	\$37,773M	High	Average

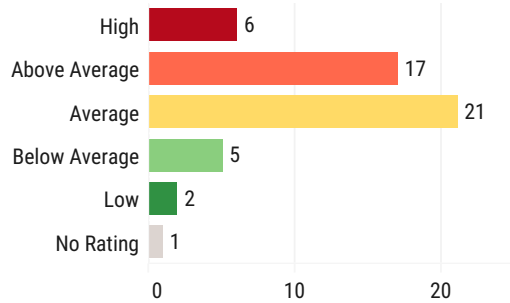
### Average Size & Style Exposure

	Growth	Core	Value
Large-cap	15.42%	10.92%	6.28%
Mid-cap	15.50%	10.81%	9.46%
Small-cap	13.82%	10.51%	6.78%

### Average Geographic Exposure



### Category Breakdown: Stock Concentration



### Average Market Development

U.S.	47.31%
Developed ex-U.S.	41.00%
Emerging	10.58%
Frontier	0.44%
Rest of World	0.61%
Unassigned	0.06%

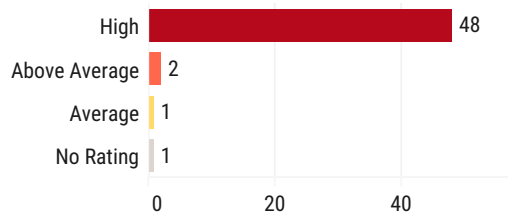
### Average Regional Exposure

North America	53.31%
Europe	26.80%
Asia Pacific	16.82%
Latin America	1.68%
Africa	1.38%
Unassigned	0.00%

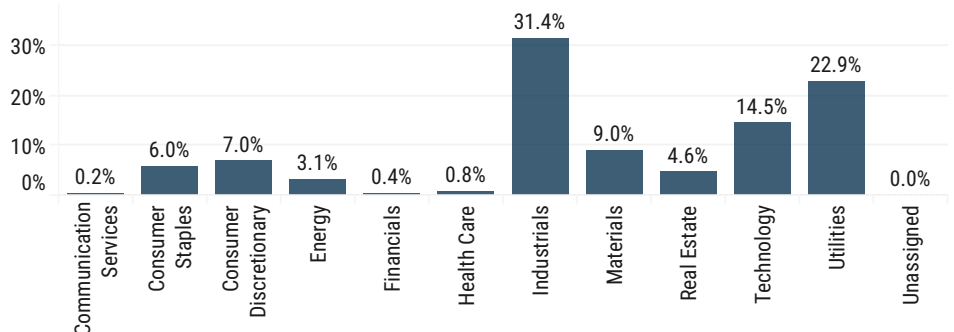
### Average Top 10 Country Exposure

United States	47.37%
China	7.53%
Canada	5.33%
United Kingdom	4.02%
Japan	3.65%
Denmark	3.34%
Germany	2.93%
France	2.83%
Spain	2.77%
Switzerland	2.74%

### Category Breakdown: Sector Concentration



### Average Sector Exposure



\*Fund count for composition and fundamentals excludes funds with no recent holdings date (ie: ETNs)

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# Equity Fundamentals



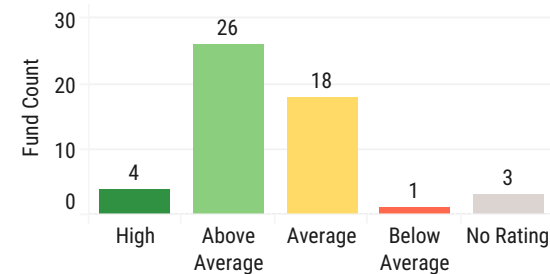
## Category: Equity: Thematic - Sustainability

As of 12/29/2023

### Valuation

Fund Count*	Avg Price / Earnings (TTM)	Avg Price / Earnings (NTM)	Avg Price / Sales (TTM)	Avg Price / Sales (NTM)	Avg Price / Cash Flow (TTM)	Avg Price / Free Cash Flow (TTM)	Avg Price / Book (TTM)
51	17.47	17.15	1.57	1.63	9.29	20.42	2.00

#### Category Breakdown: Value Rating



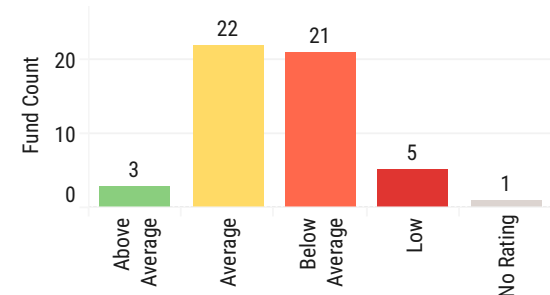
#### Top 10 Funds by Value Score

Ticker	Name	AUM	Value Rating (0-5)
CTEX	ProShares S&P Kensho Cleantech ETF	\$5.55M	4.48
KCAL	Subversive Food Security ETF	\$0.55M	4.46
TAN	Invesco Solar ETF	\$1,781.41M	4.32
KROP	Global X AgTech & Food Innovation ETF	\$4.71M	4.02
CTEC	Global X CleanTech ETF	\$63.17M	4.00
FRNW	Fidelity Clean Energy ETF	\$31.33M	3.97
BNE	Blue Horizon BNE ETF	\$5.26M	3.89
CNRG	SPDR S&P Kensho Clean Power ETF	\$263.92M	3.79
RNWZ	TrueShares Eagle Global Renewable Energy Income ETF	\$2.52M	3.78
PBD	Invesco Global Clean Energy ETF	\$153.79M	3.71

### Quality

Fund Count*	Avg Return On Equity	Avg Return On Assets	Avg Return On Invested Capital	Avg Long Term Debt / Equity	Avg Interest Coverage
51	10.6%	4.6%	5.8%	90.6%	8.5%

#### Category Breakdown: Quality Rating



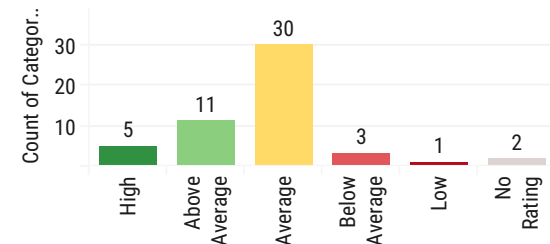
#### Top 10 Funds by Quality Score

Ticker	Name	AUM	Quality Rating (0-5)
KCAL	Subversive Food Security ETF	\$0.55M	3.28
DKRB	Subversive Decarbonization ETF	\$0.59M	3.19
ETEC	iShares Breakthrough Environmental Solutions ETF	\$3.76M	3.15
KROP	Global X AgTech & Food Innovation ETF	\$4.71M	2.97
RAYS	Global X Solar ETF	\$7.19M	2.89
BNE	Blue Horizon BNE ETF	\$5.26M	2.76
EATV	VegTech Plant-based Innovation & Climate ETF	\$5.60M	2.75
CCSO	Carbon Collective Climate Solutions U.S. Equity ETF	\$23.10M	2.61
OCEN	IQ Clean Oceans ETF	\$5.05M	2.61
TEMP	JPMorgan Climate Change Solutions ETF	\$22.43M	2.57

### Growth

Fund Count*	Avg LT Earnings	Avg Earnings Growth (TTM)	Avg Earnings Growth (NTM)	Avg Sales Growth (TTM)	Avg Sales Growth (NTM)	Avg Cash Flow Growth (TTM)	Avg Book Growth (TTM)	Avg Dividend Growth (TTM)
51	11.8%	12.8%	27.3%	8.4%	8.5%	25.0%	9.3%	5.7%

#### Category Breakdown: Growth Rating



#### Top 10 Funds by Growth Score

Ticker	Name	AUM	Growth Rating (0-5)
KGRN	KraneShares MSCI China Clean Technology Index ETF	\$66.70M	4.72
RNRG	Global X Renewable Energy Producers ETF	\$49.61M	4.62
WNDY	Global X Wind Energy ETF	\$2.89M	4.58
RAYS	Global X Solar ETF	\$7.19M	4.26
PBW	Invesco WilderHill Clean Energy ETF	\$487.76M	4.15
ACES	ALPS Clean Energy ETF	\$302.70M	3.84
ICLN	iShares Global Clean Energy ETF	\$3,097.73M	3.66
FRNW	Fidelity Clean Energy ETF	\$31.33M	3.41
PBD	Invesco Global Clean Energy ETF	\$153.79M	3.36
SMOG	VanEck Low Carbon Energy ETF	\$165.52M	3.36

\*Fund count for composition and fundamentals excludes funds with no recent holdings date (ie: ETNs)

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# Appendix: Category Funds



## Appendix: Category Funds 1-50

Ticker	Name	Inception	AUM	1 Month	3 Month	YTD	1 Year	3 Year*	5 Year*
ACES	ALPS Clean Energy ETF	6/29/2018	\$303M	10.06%	-1.34%	0.00%	-20.04%	-22.76%	10.94%
BECO	BlackRock Future Climate and Sustainable Economy ETF	8/3/2021	\$4M	4.48%	9.55%	0.00%	5.84%		
BLLD	JPMorgan Sustainable Infrastructure ETF	9/8/2022	\$26M	4.01%	15.06%	0.00%	8.87%		
BNE	Blue Horizon BNE ETF	12/8/2020	\$5M	6.85%	4.90%	0.00%	0.17%	-5.71%	
CCSO	Carbon Collective Climate Solutions U.S. Equity ETF	9/19/2022	\$23M	8.11%	7.59%	0.00%	14.56%		
CLIA	Veridien Climate Action ETF	5/8/2023	\$25M	8.80%	9.39%				
CNRG	SPDR S&P Kensho Clean Power ETF	10/22/2018	\$264M	7.48%	6.86%	0.00%	-11.53%	-11.79%	21.73%
CTEC	Global X CleanTech ETF	10/27/2020	\$63M	7.73%	-0.64%	0.00%	-25.60%	-21.64%	
CTEX	ProShares S&P Kensho Cleantech ETF	9/29/2021	\$6M	12.57%	7.46%	0.00%	-10.25%		
DKRB	Subversive Decarbonization ETF	12/22/2022	\$1M	-2.67%	-5.31%	0.00%	-0.57%		
EATV	VegTech Plant-based Innovation & Climate ETF	12/28/2021	\$6M	4.45%	4.58%	0.00%	0.73%		
ECLN	First Trust EIP Carbon Impact ETF	8/19/2019	\$30M	0.81%	7.67%	0.00%	-3.38%	4.52%	
EFRA	iShares Environmental Infrastructure and Industrials ETF	11/3/2022	\$5M	5.12%	13.15%	0.00%	14.30%		
ENRG	SoFi Smart Energy ETF	7/20/2021	\$2M	11.35%	7.39%	0.00%	-8.35%		
ERTH	Invesco MSCI Sustainable Future ETF	10/24/2006	\$234M	8.31%	6.67%	0.00%	-0.21%	-9.53%	8.82%
ETEC	iShares Breakthrough Environmental Solutions ETF	3/28/2023	\$4M	8.33%	8.29%				
EVX	VanEck Environmental Services ETF	10/10/2006	\$75M	3.84%	7.38%	0.00%	12.98%	8.81%	13.40%
FAN	First Trust Global Wind Energy ETF	6/16/2008	\$219M	7.83%	14.00%	0.00%	-3.20%	-9.43%	9.46%
FRNW	Fidelity Clean Energy ETF	10/5/2021	\$31M	9.63%	8.85%	0.00%	-19.63%		
GBLD	Invesco MSCI Green Building ETF	4/22/2021	\$6M	8.65%	17.39%	0.00%	6.39%		
GCLN	Goldman Sachs Bloomberg Clean Energy Equity ETF	2/8/2022	\$12M	3.08%	7.15%	0.00%	-4.18%		
GRID	First Trust Nasdaq Clean Edge Smart GRID Infrastructure Index	11/17/2009	\$818M	7.28%	11.91%	0.00%	21.56%	10.14%	23.21%
GRNR	Global X Green Building ETF	4/11/2022	\$2M	7.85%	16.34%	0.00%	18.43%		
GSFP	Goldman Sachs Future Planet Equity ETF	7/13/2021	\$45M	6.52%	12.77%	0.00%	5.47%		
HEAT	Touchstone Climate Transition ETF	5/2/2023	\$11M	5.00%	7.75%				
ICLN	iShares Global Clean Energy ETF	6/24/2008	\$3,098M	7.60%	7.38%	0.00%	-20.38%	-17.05%	14.79%
INFR	ClearBridge Sustainable Infrastructure ETF	12/14/2022	\$9M	3.45%	13.50%	0.00%	5.24%		
IVEG	iShares Emergent Food and AgTech Multisector ETF	4/25/2022	\$5M	5.83%	5.62%	0.00%	-2.78%		
KCAL	Subversive Food Security ETF	12/22/2022	\$1M	6.47%	3.00%	0.00%	-10.04%		
KGRN	KraneShares MSCI China Clean Technology Index ETF	10/13/2017	\$67M	2.46%	-6.90%	0.00%	-14.74%	-18.69%	7.55%
KROP	Global X AgTech & Food Innovation ETF	7/12/2021	\$5M	3.98%	-0.87%	0.00%	-23.87%		
KSEA	KraneShares Rockefeller Ocean Engagement ETF	9/12/2023	\$3M	5.80%	8.33%				
NBCT	Neuberger Berman Carbon Transition Infrastructure ETF	4/6/2022	\$27M	5.15%	12.10%	0.00%	7.46%		
OCEN	IQ Clean Oceans ETF	10/21/2021	\$5M	5.80%	17.36%	0.00%	19.11%		
PBD	Invesco Global Clean Energy ETF	6/13/2007	\$154M	7.52%	5.13%	0.00%	-10.66%	-21.28%	10.90%
PBW	Invesco WilderHill Clean Energy ETF	3/3/2005	\$488M	8.12%	-4.82%	0.00%	-20.00%	-32.23%	9.07%
PWER	Macquarie Energy Transition ETF	11/28/2023	\$6M	5.92%					
QCLN	First Trust Nasdaq Clean Edge Green Energy Index Fund	2/8/2007	\$1,160M	11.13%	-0.89%	0.00%	-10.03%	-15.37%	19.70%
RAYS	Global X Solar ETF	9/8/2021	\$7M	9.80%	-2.07%	0.00%	-35.13%		
RNEW	VanEck Green Infrastructure ETF	10/18/2022	\$2M	6.15%	4.35%	0.00%	2.89%		
RNRG	Global X Renewable Energy Producers ETF	5/28/2015	\$50M	7.49%	13.62%	0.00%	-12.82%	-13.66%	2.25%
RNWZ	TrueShares Eagle Global Renewable Energy Income ETF	12/8/2022	\$3M	6.53%	14.63%	0.00%	-3.87%		
SDG	iShares MSCI Global Sustainable Development Goals ETF	4/20/2016	\$354M	5.51%	9.82%	0.00%	4.61%	-2.94%	10.60%
SIMS	SPDR S&P Kensho Intelligent Structures ETF	12/26/2017	\$20M	5.41%	8.86%	0.00%	7.43%	-5.16%	8.44%
SMOG	VanEck Low Carbon Energy ETF	5/3/2007	\$166M	7.57%	7.32%	0.00%	1.43%	-11.58%	15.96%
SOLR	Guinness Atkinson Funds SmartETFs Sustainable Energy II Fund	11/11/2020	\$5M	8.34%	8.58%	0.00%	-0.78%	-0.83%	
TAN	Invesco Solar ETF	4/15/2008	\$1,781M	11.55%	3.11%	0.00%	-26.79%	-19.61%	23.65%
TEMP	JPMorgan Climate Change Solutions ETF	12/13/2021	\$22M	7.07%	13.42%	0.00%	11.19%		
UPGR	Xtrackers US Green Infrastructure Select Equity ETF	7/12/2023	\$5M	8.75%	5.04%				
VCLN	Virtus Duff & Phelps Clean Energy ETF	8/3/2021	\$7M	4.49%	7.02%	0.00%	-19.09%		

\*Annualized performance. Returns based on market price.

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## Appendix: Category Funds 51-100

Ticker	Name	Inception	AUM	1 Month	3 Month	YTD	1 Year	3 Year*	5 Year*
<b>WNDY</b>	Global X Wind Energy ETF	9/8/2021	\$3M	6.96%	8.30%	0.00%	-22.22%		
<b>YUMY</b>	VanEck Future of Food ETF	11/30/2021	\$3M	3.68%	5.69%	0.00%	-7.86%		

\*Annualized performance. Returns based on market price.

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The historical returns presented include all items of dividends and interest net of fees unless otherwise stated. Model portfolio and blended model portfolio analysis utilizes position data provided by the model sponsor and/or the user back to the initial asset allocation date provided. There is no guarantee that these hypothetical returns could or would have been achieved had this asset allocation or model portfolio been used during the years presented. Results shown are provided for illustrative purposes only. Past performance is not indicative of future results.

Performance data are based on actual returns of the investment strategies and securities in the portfolio and are provided for illustrative purposes only. Data and performance may be limited due to lack of published performance data either by the issuer or investment manager, or the availability of such data sources to FactSet. Aggregated data and average performance figures are calculated as simple averages of all funds that existed at that point in time for a specific category. All funds currently classified within a category will contribute to average historical performance figures such that a survivorship bias may be present for average category performance figures.

**Past performance is not an indicator of future performance.** The model portfolio and blended model portfolio returns presented are calculated based on historical investment position data provided by the model sponsor and/or user. The returns do not reflect the actual trading of any account or group of accounts and are thereby hypothetical in nature. Model position changes are implemented using closing prices on position date provided unless otherwise stated and the returns reflect the reinvestment of dividends and interest. The impact of fund fees held in the model portfolios is reflected in the returns for all periods presented. Model portfolio returns shown are net of fees provided by model sponsor and/or user and are prominently displayed in each model portfolio.

## ASSET CLASS DEFINITIONS & RISK DISCLOSURES:

US Equities include stocks listed in the United States, including small-cap and mid-cap equities, Master Limited Partnerships (MLPs), Real Estate Investment Trusts (REITs), and alternative equity securities, including covered call ETFs and hedged ETFs or ETFs that make use of derivatives. Stocks represent partial ownership of a corporation. If the corporation does well, its value can increase, and investors can share in the appreciation. However, if it goes bankrupt, or performs poorly, investors can lose their entire initial investment (i.e., the stock price can go to zero). MLP investing includes risks such as equity- and commodity-like volatility. Also, distribution payouts sometimes include the return of principal and, in these instances, references to these payouts as "dividends" or "yields" may be inaccurate and may overstate the profitability/success of the MLP. There are potentially complex and adverse tax consequences associated with investing in MLPs. There are special risks associated with an investment in real estate and REITs, including credit risk, interest rate fluctuations and the impact of varied economic conditions. A covered call option involves holding a long position in a particular asset, in this case US common equities, and writing a call option on that same asset with the goal of realizing additional income from the option premium. Certain ETFs use a covered call strategy. By selling covered call options, the fund limits its opportunity to profit from an increase in the price of the underlying index above the exercise price but continues to bear the risk of a decline in the index. Using a hedge or a hedged product does not insulate the portfolio against losses.

Global equities are equities that span across both developed countries and emerging markets. Investments in international and emerging markets securities include exposure to risks such as currency fluctuations, foreign taxes and regulations, and the potential for illiquid markets and political instability.

International Equities are equities that span across both developed countries and emerging markets, excluding U.S. equities. Investments in international and emerging markets securities include exposure to risks such as currency fluctuations, foreign taxes and regulations, and the potential for illiquid markets and political instability.

Developed international equities are large cap and mid cap equities in developed countries excluding the U.S. and Canada. International investments involve greater risks than U.S. investments, and can decline significantly in response to adverse issuer, political, regulatory, market, and economic risks.

Emerging market equities are large cap and mid cap equities in emerging market countries. Emerging market countries are countries with economies that are considered rapidly expanding and engaging aggressively in global markets. In addition to the risks associated with all international investing, inflation and rapid fluctuations in inflation rates have had, and may continue to have, negative effects on the economies and securities markets of certain emerging market countries.

Investment grade fixed income securities include broad fixed income, corporate securities, municipal bonds, treasuries, and mortgage backed securities (MBS). Investment grade securities are believed to be at less risk of default and rated higher by the credit rating agencies. In general, the bond market is volatile, and fixed income securities carry interest rate risk. (As interest rates rise, bond prices usually fall, and vice versa). This effect is usually more pronounced for longer-term securities.

Fixed income securities also carry inflation risk, liquidity risk, call risk and credit and default risks for both issuers and counterparties. The municipal market can be affected by adverse tax, legislative, or political changes, and by the financial condition of the issuers of municipal securities. MBS are subject to prepayment and extension risk; as such, they react differently to changes in interest rates than other bonds. Small movements in interest rates may quickly and significantly reduce the value of certain MBS.

Alternative fixed income asset class includes high yield, preferreds, bank loans, currency funds, developed non-US debt, emerging market debt, TIPS, and floaters. Lower-quality fixed income securities found in this category involve greater risk of default or price changes due to potential changes in the credit quality of the issuer. Any fixed-income security sold or redeemed prior to maturity may be subject to loss. Additionally, non-US/emerging market debt assumes the same risks as international investing.

Cash & Equivalents include direct cash positions and underlying cash positions within fund positions within a model. This also includes money market funds that may be held by the model or underlying positions.

Unassigned designations are used for positions that include options, commodities contracts, or other derivatives, and may not have composition data available.

Commodities include securities that tract bulk goods and raw materials, such as grains, metals, livestock, oil, cotton, coffee, sugar, and cocoa, that are used to produce consumer products. Buying commodities allows for a source of diversification for those sophisticated persons who wish to add this asset class to their portfolios and who are prepared to assume the risks inherent in the commodities market. Any commodity purchase represents a transaction in a non-income-producing asset and is highly speculative. Therefore, commodities should not represent a significant portion of an individual's portfolio.

Alternatives are securities that are typically less or inversely correlated with Equities and Fixed Income such as Index Volatility ETFs. Alternative investments are often non income producing and highly speculative. Therefore, alternative investments should not represent a significant portion of an individual's portfolio.

Dividends are not guaranteed and are subject to change or elimination.

ETFs are subject to substantially the same risks as those associated with the direct ownership of the underlying securities owned by the ETF. Additionally, the value of the investment will fluctuate in response to the performance of the underlying index or securities. ETFs typically charge therefore, investments in ETFs will result in the layering of expenses.

## DEFINITIONS:

Acquired Fund Fees is the weighted average of the expense ratios of all model holdings.

Distribution yield refers to the percentage of income a portfolio has distributed to investors over the last 12 months. At the model level, this is calculated as a weighted average of TTM yield for all model holdings. This is based on fund and/or stock distributions, and is not a look-through calculation.

Geometric return is a measure of the compound rate of growth in a portfolio. This method eliminates the distorting effects created by inflows of new money. This is also called the 'geometric mean return,' as the reinvestment is captured by using the geometric total and mean, rather than the arithmetic total and mean. It is assumed that all cash distributions are reinvested in the portfolio and the exact same periods are used for comparisons. The difference between the two return measures is caused by volatility. The more volatile the asset class, the bigger the difference between its geometric and average annual returns. The geometric mean return is typically lower than the arithmetic mean return.

Pure gross returns are calculated before the deduction of advisory fees, trading expenses and other fees. Net of fees performance reflects the deduction of the advisory fees charged to the client, trading expenses, and other costs associated with investments made by the client. Returns do not include the reinvestment of dividends.

Standard deviation is a measure of the dispersion of a set of data from its mean. The more spread apart the data is, the higher the deviation. Calculated using monthly returns.

Alpha refers to the performance differential between a specific investment and that of the investment's beta multiplied by its benchmark. It isolates the portion of total return not accredited to movement in the broader market. Calculated using monthly returns.

Beta is a measure of the volatility—or systematic risk—of a security or portfolio compared to its relative benchmark. Securities with betas higher than 1.0 can be interpreted as more volatile relative to movements in the market benchmark while securities with a beta less than 1.0 can be interpreted as less volatile relative to movements in the market benchmark. Calculated using monthly returns.

The Sharpe ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk. Volatility is a measure of the price fluctuations of an asset or portfolio. Calculated using monthly returns.

The correlation coefficient is a statistical measure of the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0. A calculated number greater than 1.0 or less than -1.0 means that there was an error in the correlation measurement. A correlation of -1.0 shows a perfect negative correlation, while a correlation of 1.0 shows a perfect positive correlation. A correlation of 0.0 shows no linear relationship between the movement of the two variables. Calculated using monthly returns.

R-squared (R<sup>2</sup>) is a statistical measure that represents the proportion of the variance for a dependent variable that's explained by an independent variable or variables in a regression model. Calculated using monthly returns.

Tracking error is the divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark. This is often in the context of a hedge fund, mutual fund, or exchange-traded fund (ETF) that did not work as effectively as intended, creating an unexpected profit or loss. Tracking error is reported as a standard deviation percentage difference, which reports the difference between the return an investor receives and that of the benchmark they were attempting to imitate. Calculated using monthly returns.

The upside capture ratio measures an investment manager's relative performance during bull markets. The ratio is calculated by comparing the manager's returns in up-markets with that of a benchmark. Calculated using monthly returns.

The down-market capture ratio is a statistical measure of an investment manager's overall performance in down-markets. It is used to evaluate how well an investment manager performed relative to an index during periods when that index has dropped. The ratio is calculated by dividing the manager's returns by the returns of the index during the down-market and multiplying that factor by 100. Calculated using monthly returns.

A drawdown refers to how much an investment or trading account is down from the peak before it recovers back to the peak. Drawdowns are typically quoted as a percentage, but dollar terms may also be used if applicable for a specific trader. Drawdowns are a measure of downside volatility. Calculated using monthly returns.

Market capitalization is the sum of the total value of a company's outstanding shares multiplied by the price of one share. With a weighted average market capitalization, components that have a higher market cap have more influence because they constitute a higher percentage in the index; those with smaller caps have less influence.

The Price/Earnings Ratio or P/E Ratio is a valuation metric that assesses how many dollars investors are willing to pay for one dollar of a company's earnings. It's calculated by dividing a stock's price by the company's trailing 12-month earnings per share from continuous operations. Negative P/E ratios are excluded. Calculated using weighted harmonic average.

The forward (or leading) P/E uses future earnings guidance rather than trailing figures. Negative P/E ratios are excluded. Calculated using weighted harmonic average.

The Price/Sale (P/S) ratio is a stock's current price divided by the company's trailing 12-month sales per share. This represents the weighted average of the price/sales ratios of the stocks in a fund's portfolio. Price/sales represents the amount an investor is willing to pay for a dollar generated from a particular company's operations. Calculated using weighted harmonic average.

The forward (or leading) P/S uses future sales estimates rather than trailing figures. Calculated using weighted harmonic average.

The price/book (P/B) ratio of a fund is the weighted average of the price/book ratios of all the stocks in a fund's portfolio. Book value is the total assets of a company, less total liabilities (sometimes referred to as carrying value). A company's book value is calculated by dividing the market price of its outstanding stock by the company's book value, and then adjusting for the number of shares outstanding (Stocks with negative book values are excluded from this calculation.). Calculated using weighted harmonic average.

The price-to-cash flow (P/CF) ratio is a stock valuation indicator or multiple that measures the value of a stock's price relative to its operating cash flow per share over the trailing twelve months. The ratio uses operating cash flow (OCF), which adds back non-cash expenses such as depreciation and amortization to net income. Calculated using weighted harmonic average.

Price to free cash flow is an equity valuation metric used to compare a company's per-share market price to its per-share amount of free cash flow (FCF) over the trailing twelve months. This metric is very similar to the valuation metric of price to cash flow but is considered a more exact measure, owing to the fact that it uses free cash flow, which subtracts capital expenditures (CAPEX) from a company's total operating cash flow, thereby reflecting the actual cash flow available to fund non-asset-related growth. Negative P/E ratios are excluded. Calculated using weighted harmonic average.

The price/earnings to growth ratio (PEG ratio) is a stock's price-to-earnings (P/E) ratio divided by the growth rate of its earnings for a specified time period (NTM - next twelve months). The PEG ratio is used to determine a stock's value while also factoring in the company's expected earnings growth, and it is thought to provide a more complete picture than the more standard P/E ratio. Calculated using weighted harmonic average.

The dividend yield, expressed as a percentage, is a financial ratio (dividend/price) that shows how much a company pays out in dividends each year relative to its stock price. Unless otherwise stated, dividend yield takes the distributions over the trailing 12 months divided by the price on the as of date. Note that the dividend yield is a look through of all funds and securities to underlying holdings, and may not reflect what the fund or model actually distributes. Calculated using weighted harmonic average.

Gross margin is a ratio that equates to net sales minus the cost of goods sold divided by net sales. The gross margin shows the ratio of profit made before deducting selling, general, and administrative (SG&A) costs. Calculated using weighted average.

The net margin is a measure of profitability. It is equal to annual net income divided by revenues over the trailing 12 months. The resulting figure is then multiplied by 100. Calculated using weighted average.

Return on equity (ROE) is the percentage a company earns on its total equity in a given year. ROE shows how much profit a company generates on the money shareholders have invested in the firm. Calculated using weighted average.

Return on assets (ROA) is the percentage a company earns on its assets in a given year (Year 1, 2, etc.). The calculation is net income divided by end-of-year total assets. The resulting figure is then multiplied by 100. For a mutual fund, ROA represents a weighted median figure such that approximately 50% of the domestic stocks in the portfolio will have a greater ROA and roughly 50% of these domestic stocks will have a lower ROA than the weighted median. Calculated using weighted average.

Return on invested capital (ROIC) is the percentage of money a company earns that is above the average cost it pays for its debt and equity capital. Calculated using weighted average.

The interest coverage ratio is a debt and profitability ratio used to determine how easily a company can pay interest on its outstanding debt. The interest coverage ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) by its interest expense during a given period. Calculated using weighted average.

The debt-to-equity (D/E) ratio is used to evaluate a company's financial leverage and is calculated by dividing a company's total liabilities by its shareholder equity. Calculated using weighted average.

The payout ratio, also known as the dividend payout ratio, shows the percentage of a company's earnings paid out as dividends to shareholders over the trailing twelve months. Calculated using weighted average.

Per share growth metrics calculate the growth metrics over the trailing twelve months (TTM) or estimated growth metrics over the next twelve months (NTM) for Earnings, Sales, Cash Flow, Free Cash Flow, Book Value, and Dividends. Calculated using weighted median.

Long-Term earnings (LT Earnings) calculates the growth in earnings per share over longer time horizons (5 years). Calculated using weighted median.

The coupon rate is calculated by weighting each bond's coupon by its relative size in the portfolio. It indicates whether the underlying fund owns more high- or low-coupon bonds. There can be advantages to holding higher coupon bonds, but many funds buy them simply to tempt investors with a high payout. This can be damaging to investors for two reasons. The first is that higher-coupon bonds often carry greater risk than lower-coupon issues. The second is that when these bonds don't carry extra risk, they are old issues that the fund has paid up for and if the offering doesn't amortize the extra yield, investors are likely to find that their principal erodes over time. Calculated using weighted average.

Effective duration is a measure of a fund's interest-rate sensitivity; the longer a fund's duration, the more sensitive the fund is to shifts in interest rates. Duration is determined by a formula that includes coupon rates and bond maturities. Small coupons tend to increase duration, while shorter maturities and higher coupons shorten duration. The relationship between funds with different durations is straightforward: A fund with a duration of 10 years is twice as volatile as a fund with a five-year duration. Calculated using weighted average.

Modified Duration expresses the measurable change in the value of a security in response to a change in interest rates. Calculated using weighted average.

Average effective maturity is a weighted average of all the maturities of the bonds in a portfolio, computed by weighting each bond's effective maturity by the market value of the security. Average effective maturity takes into consideration all mortgage prepayments, puts, and adjustable coupons. Longer-maturity funds are generally considered more interest-rate sensitive than their shorter counterparts. We list Average Effective Maturity for Taxable Fixed-Income and Hybrid funds and Average Nominal Maturity for Municipal Bond Funds. Since this is collected by survey, it is important to bear in mind that different fund companies may use different interest-rate assumptions in determining call likelihood and timing. Generally speaking, the longer the maturity, the greater the interest rate risk. When duration is unavailable, this is used in the calculation of the fixed income style box. Calculated using weighted average.

Yield to Maturity: is the holding weighted average yield of all applicable holdings within a portfolio. Yield is a measure of the expected rate of return. Calculation of yield to maturity of a security ignores the impact of options such as a call or put feature. Calculated using weighted average.

Yield to worst is calculated on all possible call dates. It is assumed that prepayment occurs if the bond has call or put provisions and the issuer can offer a lower coupon rate based on current market rates. If market rates are higher than the current yield of a bond, the yield to worst calculation will assume no prepayments are made, and yield to worst will equal the yield to maturity.

The assumption is made that prevailing rates are static when making the calculation. The yield to worst will be the lowest of yield to maturity or yield to call (if the bond has prepayment provisions); yield to worst may be the same as yield to maturity but never higher. Calculated using weighted average.

Convexity demonstrates how the duration of a bond changes as the interest rate changes. If a bond's duration increases as yields increase, the bond is said to have negative convexity. If a bond's duration rises and yields fall, the bond is said to have positive convexity. Calculated using weighted average.

Key rate duration measures how the value of a debt security or a debt instrument portfolio, generally bonds, changes at a specific maturity point along the entirety of the yield curve. When keeping other maturities constant, the key rate duration is used to measure the sensitivity in a debt security's price to a 1% change in yield for a specific maturity.

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