Sierra Club Green Alpha

March 31, 2023

Green Alpha®

Why Invest in Sierra Club Green Alpha?

- Active research, stock selection, and portfolio mgmt
- Green Alpha's forward-looking Next Economy™ research processes, and the Sierra Club's® proprietary social and environmental criteria
- 30-50 global, market-leading companies developing solutions to core economic and environmental risks

Inception Date: December 31, 2010

Vehicle: Separately Managed Accounts

Investment Philosophy

The greatest growth drivers of today's economy are high-functioning, inventive companies creating and accelerating solutions to system-level risks—the climate crisis, resource degradation, widening inequality, and human disease burdens. Those companies are our best investment opportunity to preserve and grow clients' capital.

Green Alpha's philosophy is simple: seek enterprises creating scalable and rapidly evolving, economically-competitive solutions, rigorously evaluate their fundamentals, and acquire them at reasonable valuations.

Our investments seek to de-risk the global economy (which in turn reduces clients' long-term investment risks) while striving to grow faster than underlying GDP.

Research

Across our portfolios, we seek companies:

- with products and/or services lowering the global economy's risk profile by creating solutions to our most pressing economic and environmental risks
- committing more capital to R&D and owning more intellectual property than their peers
- run by effective, diverse executive teams and boards of directors with track records of increasing revenues and expanding margins, leading to earnings growth
- exhibiting sound financial fundamentals
- trading at compelling valuations relative to proven and anticipated growth, within acceptable levels of risk

Portfolio Construction

Green Alpha is proud to be the only financial services firm licensed to utilize the Sierra Club's rigorous environmental and social guidelines. These criteria are applied to our Next Economy investing philosophy and research, resulting in what may be the most progressive, sustainability-focused stock portfolio available.

Every portfolio holding is a high-impact, forward-looking Next Economy solutions provider contributing to the transition to a sustainable economy, with a Sierra Club-compliant operating history.

Largest Positions

How the Sierra Club Green Alpha portfolio is driving progress toward the Next Economy

Company Name	Ticker	Weight
First Solar	FSLR	7.63%
JinkoSolar Holding	JKS	5.94%
Brookfield Renewable	BEPC	4.25%
Vestas Wind Systems	VWDRY	4.10%
Lam Research	LRCX	3.63%
% of Portfolio		25.55%

First Solar *(Sector: Energy, Industry: Renewable Energy)*

- First Solar manufactures solar panels and provides utility-scale PV power plants and supporting services, including finance, construction, maintenance, and end-of-life panel recycling. They employ rigid thin-film modules for its solar panels and cadmium telluride (CdTe) as a panel semiconductor.
- Unique among large solar manufacturers, First Solar is a U.S.-headquartered company and does not use crystalline silicon (c-Si) semiconductors. That means they have fewer supply chain dependencies than traditional c-Si solar PV makers and avoid dependencies on China, which dominates the c-Si industry.
  - ✓ Catalysts driving performance results are already-strong order flow and the passage of the Inflation Reduction Act (“IRA”).
- Under the IRA, First Solar could earn subsidies as high as 17 cents per watt of capacity, which is more than half of their reported production cost.
- The company plans to grow revenues by investing $1.1 billion in a new, 3.5 GW module factory in Alabama, the company’s fourth domestic facility, while an additional $185 million will add 1 GW of new manufacturing to the company's plant in Ohio.
- First Solar has a vertically integrated manufacturing process providing the lowest carbon footprint and fastest energy payback time available.
- The board of directors is 25% women, including the Lead Independent Director and Audit Committee Chair. The Chief People & Communications Officer is also female. Importantly, the executive team boasts an above-average age spread of 32 years.

JinkoSolar Holding *(Sector: Energy, Industry: Renewable Energy)*

- JinkoSolar (JKS) is one of the world’s largest solar panel manufacturers and the most vertically integrated, making ingots, cells, panels, and modules. JKS distributes to 160 countries and manufactures products in the U.S., China, Malaysia, and Vietnam, thus mitigating political and trade dispute-related growth obstacles. They have been able to largely withstand recent global supply chain disputes.
- JinkoSolar's production capacity is expanding. In 2021, the company had a total production capacity of 55 GW. In 2022, the company plans to increase its production capacity to 75 GW. By the end of 2023, JinkoSolar expects to have a total production capacity of 90 GW. Of the world’s top five PV manufacturers, JKS alone has grown its global module market share in the last year and has ranked number one in global shipments for the past four years.
- The company continues to emphasize R&D, achieving mass production efficiency exceeding 26.1% for their 16 GW N-type cells, which is a world record for n-type solar cell efficiency.
- JKS is the top-ranked firm on the Silicon Valley Toxics Coalition’s Solar Scorecard, receiving 100 out of 100 points for operational sustainability. The company plans to run on 100% renewable energies by 2025 and is a member of RE100.

Brookfield Renewable *(Sector: Utilities, Industry: Electric Utilities)*

- Brookfield Renewable is a leading renewable power company that owns and operates a portfolio of solar, wind, and hydroelectric power generation and storage facilities in North America, South America, Europe, and Asia.

***Brookfield**, **Vestas Wind Systems**, and **Lam Research**’s Next Economy attributes are continued on the following page.*

Largest Positions *continued*

Brookfield *continued*

- Brookfield is one of the largest renewable power companies in the world, with a portfolio of over 24,000 megawatts of generating capacity. The company's mission is to provide sustainable energy solutions that help people and businesses thrive. They are committed to developing and operating renewable energy projects that are environmentally responsible, socially beneficial, and economically viable.
- Brookfield is conservatively managed, continually looking for acquisitions at favorable prices and organic development to grow generation capacity, and has revenues largely backed by long-term power purchase agreements (PPAs). Brookfield is inflation resilient and may benefit from an inflationary environment, because their generating costs are fixed but their PPAs are indexed to inflation.
- Women comprise 30% of board directors (including the Audit Committee Chair), 25% of overall workforce, and 26% of the exec team. The exec team has a robustly above-average age spread of 48 years, as does the board at 38 years.

Vestas Wind Systems *(Sector: Energy, Industry: Renewable Energy)*

- A front runner in the global energy transition, Vestas is the world's most advanced wind turbine manufacturer, and the global leader in onshore, offshore, and grid-connected installations. Vestas is also a leading service contract provider, furnishing the company with meaningful higher-margin recurring revenue.
- Vestas' order backlog is over 50 billion Euros and service order backlog is over 5 billion Euros. New order intake has accelerated into 2023, with 3.022 GW in new orders in Q1 alone, and the service segment continues to gain momentum.
- They have 141+ GW under service contracts, with 125+ GW located offshore. The average service contract duration is 10 years, providing a long runway of revenue transparency.
- Vestas is targeting carbon neutral operations—without use of carbon offsets—by 2030 and zero-waste wind turbines by 2040.
- Vestas' board is comprised of five women (42%). Of the 12 members, eight were elected by shareholders and four were elected by Denmark-based employees. Women serve on all committees and comprise half of the Nomination & Compensation Committee.

Lam Research *(Sector: Technology, Industry: Semiconductors)*

- Lam Research is a global supplier of semiconductor and flat panel display manufacturing equipment and services. The company provides a wide range of products and services that enable the production of advanced semiconductor devices used in a variety of applications, including computers, smartphones, automotive electronics, and medical devices. The company's products include wafer fabrication equipment, etch and deposition systems, and metrology and inspection systems.
- Lam is known for its innovation and technological leadership in the semiconductor industry, with a strong focus on research and development to advance semiconductor manufacturing processes. The company has a strong intellectual property portfolio, with over 17,000 patents granted or pending worldwide.
- The company has a strong customer base, including major semiconductor manufacturers in North America, Asia, and Europe such as Intel, Samsung, and TSMC
- Lam Research has a strong commitment to sustainability and corporate responsibility, with initiatives focused on reducing the environmental impact of its operations, promoting ethical business practices, and supporting the communities where it operates.

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Macroeconomic Commentary

> In the first quarter of 2023, the global economy continued to be characterized by the key challenges of 2022, including the ongoing COVID-19 pandemic, the war in Ukraine, rising inflation, and interest rate hikes. These challenges have had a significant impact on economic growth, trade, and investment, which has led to continued high market volatility.

For Green Alpha strategies, January 2023 provided double-digit performance gains as some of the above-listed concerns seemed to be easing, and then tougher markets in February and March as some issues seemed to reassert themselves, capped off by a positive rally at quarter-end as markets reverted to a more January-like dynamic. And yet, in context, inflation, interest rate concerns, and even geopolitical conflicts have historically been short-to-medium term sources of market volatility. As always, we endeavor to think about the longer term, and position our portfolios to preserve and grow our clients' purchasing power over multi-cycle periods.

And yes, the global economy is also facing long-term challenges, such as the climate crisis, inequality, and technological change. These challenges will require governments, businesses, and individuals to work together to find solutions, and, in overcoming them, the world will make significant—it is not an exaggeration to say unprecedented—investments in the best of these solutions. The patient, forward-looking investor therefore stands to benefit. To illustrate, let's look at a couple of sectors that saw big changes in Q1.

Carefully Navigating Tech's Rapidly Evolving Landscape

The way we understand the tech economy is changing dramatically. Large language models (LLM) are exponentially improving, seemingly by the week, and traditional search and ad serving businesses are looking less like the indefinite cash cows that they did just last year. The codes for these models are improving so fast, in part, because the models themselves are becoming partially self-recursive in that they produce content not only in natural language but in code itself, meaning software engineers now have very capable "co-pilots" to help them develop the next LLM iteration faster than the last (this is part of why we don't buy the general argument that productivity gains have flatlined). Ultimately, these models will be capable of generating ever-improving versions of themselves without direct human intervention and will be limited only by the capabilities of their underlying hardware.

Speaking of which, we can't let this subject pass without acknowledging a key vulnerability to the global economy: utter dependence on the Taiwan Semiconductor Manufacturing Company (TSMC). According to recent reporting in Wired, TSMC is home to "the world's biggest logic chip manufacturing capacity and produces, by one analysis, a staggering 92 percent of the world's most avant-garde chips…Perhaps more to the point, TSMC makes a third of all the world's silicon chips, notably the ones in iPhones and Macs. Every six months, just one of TSMC's 13 foundries—the redoubtable Fab 18 in Tainan—carves and etches a quintillion transistors for Apple. In the form of these miniature masterpieces, which sit atop microchips, the semiconductor industry churns out more objects in a year than have ever been produced in all the other factories in all the other industries in the history of the world." Unfortunately, this stunning and so far, singular capability resides on one island whose government believes it is a sovereign nation, but that is also claimed as territory by China.

Let's face facts: the wonders we see from the LLMs don't occur in isolation. OpenAI, Microsoft, Google, Nvidia, Apple, and many more tech titans are utterly dependent on this one island with its N-of-One capabilities. The complex code that gives us ChatGPT and its kin have been made possible by the technological achievements at TSMC that brings forth the hardware capable of running these monster programs.

Continued on the following page

Macroeconomic Commentary *continued*

To run ChatGPT and others, Microsoft Azure says they leverage up to "thousands of NVIDIA H100 GPUs interconnected by NVIDIA Quantum-2 InfiniBand networking," all made at TSMC. We're not big on fossil fuel analogies here at Green Alpha but imagine a world where Saudi Arabia has 92%of the world's oil reserves and is at the same time struggling to maintain its independence from a determined world superpower. This overwhelming dependency on TSMC means the world's economy is far more vulnerable to disruption than is generally assumed, and of course also means that TSMC is a significant holding in many Green Alpha investment strategies. Challenge and opportunity, hand-in-hand, as always.

Volatility is Unlocking Opportunities: Investing in REITs

Tech isn't the only place where the challenge/opportunity dynamic exists. We can also see it in the more prosaic field of real estate. Real Estate Investment Trusts (REITs) have had a tough time in 2022 and Q1 2023 in the face of unprecedented Federal Reserve rate hikes and the ongoing phenomenon of work-from-home catalyzed by COVID-19. This pair of headwinds has caused even some of the highest quality REITs to be down more than 70% in the trailing year at the end of Q1 '23, and, clearly with some justification. Looking more closely, though, we can see that not all REITs are, by any means, equal. While many mid-tier and lower quality office REITs are reporting occupancy levels not much better than 50%, the highest quality office REITs, with AAA space, great sustainability profiles, and in desirable markets, are more than 90% occupied with relatively strong lease pricing power.

Moreover, specialty REITs like those providing lab space for biotechnology are actively growing. The predilection of traders and algorithms to bid down the entire sector is basically a scorched earth approach that has resulted in some amazing value opportunities among the gems in the space. Benefitting from these low entry points requires patience, but is not, in our opinion, particularly risky for the long-term investor. It's all about waiting for markets to appreciate that not all REITs are created equal, and the quality names have been oversold. Meanwhile, REITs compensate us for this patience with returns in the form of a dividend while we wait. This approach isn't new in investing, it is a straightforward example of time-arbitrage; while we can't be sure if it is or is not too soon to enter the highest-quality REIT space, we know for sure it is not too late. At some point, it will be.

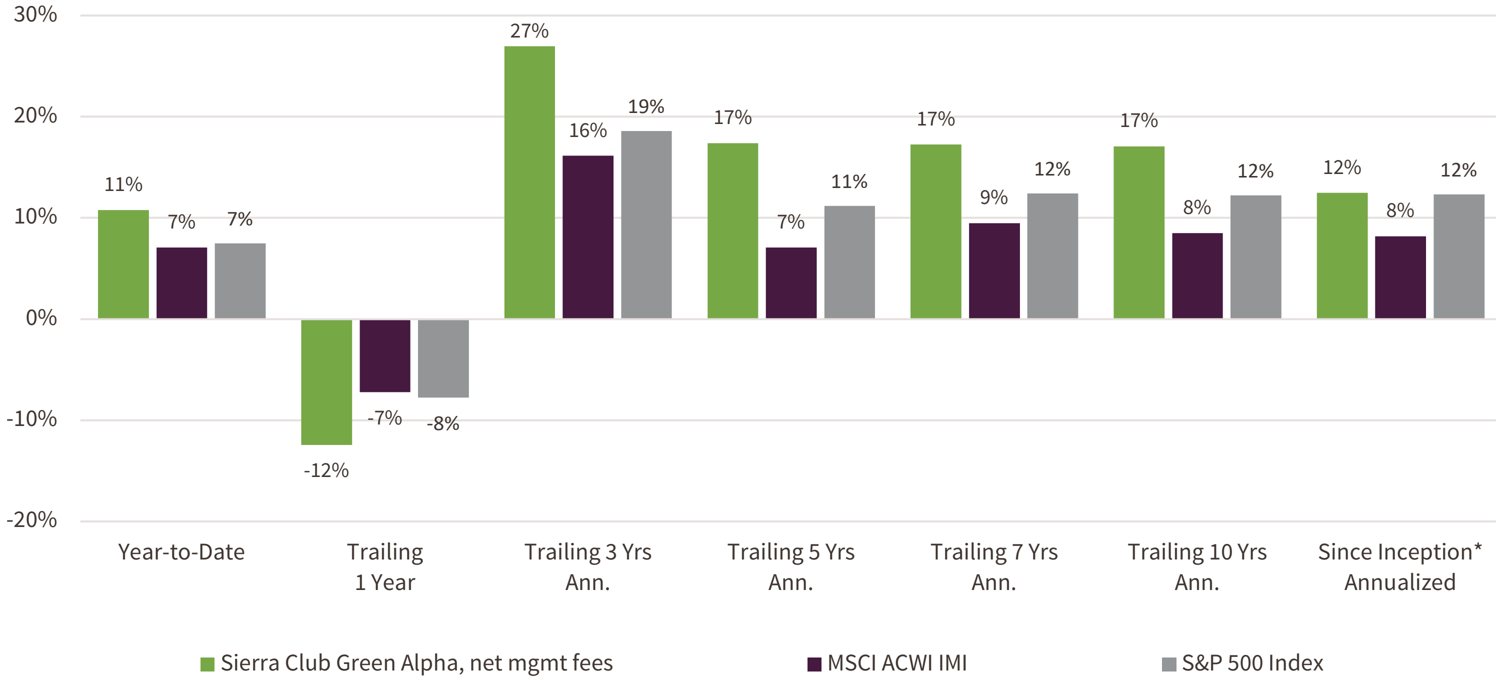
Remain Focused

Tech and REIT stocks are not often particularly correlated. As we've seen, they have very different dynamics, dependencies, and fundamentals; holding both is generally considered wise diversification. And yet, we have seen the global leaders in both industries lose share price value recently, even sometimes when their business results were good and improving.

The best thing an investor can do in volatile environments like these is maintain thesis conviction and convert the nearer term challenges into long-term opportunities via a carefully curated basket of securities. Near-term challenges create volatility, long-term challenges show us where to look for growth.

If you are a Green Alpha client, contact betsy@greenalphaadvisors.com to inquire whether your account(s) holds any of the securities listed in this macroeconomic commentary. At the time this commentary was written, Green Alpha held shares in Taiwan Semiconductor Manufacturing Co (TSM), NVIDIA (NVDA), and Apple (AAPL) in some client accounts. No Green Alpha client accounts held shares in Microsoft (MSFT) or Google (GOOG) at the time of authorship. Please see the final page of this document for additional related disclosures.

Portfolio Performance & Commentary



For Q1 2023, the Sierra Club Green Alpha strategy returned 10.76% net of management fees, versus its benchmark, the MSCI All Country World Investable Market Index (MSCI ACWI IMI), which returned 7.09%

The strategy's best performing sectors were Energy and Technology.

- Within Energy, returns were derived from renewable energy equipment makers, with solar equipment representing the lion's share of upside contribution. Specifically, the world's leading thin-film solar PV maker had an outstanding quarter, as it announced benefits from the Inflation Reduction Act ("IRA") and capacity expansion plans. Other renewable energy contributions were from traditional C-Si PV makers, balance-of-system providers, and battery storage. In wind energy, America's largest advanced composite materials maker for turbine blades also contributed positively.
- In the Technology sector, the semiconductor value chain contributed the most to returns, including gains from front-end capital equipment makers, chip designers, and foundry manufacturing. Catalysts for Semis in the quarter included early implementation of the CHIPS Act, growing recognition of the importance of semis to the global economy, and multiple announcements related to expansion of global production capacity. Within the technology hardware industry, communications equipment contributed modest gains. Gains were also provided by both security and engineering software makers.

The sectors detracting the most from the strategy's returns in the quarter were Real Estate and Health Care.

- Within Real Estate, losses on office Real Estate Investment Trust s ("REITs") were partially offset by gains in data center and infrastructure REITs. Office REITs were under pressure given the interest rate environment and the narrative around work-from-home. However, we believe the highest-quality sustainable office REITs have been oversold vs. industry peers and currently present attractive long-term buying opportunities.
- Health Care was affected by losses in two of the world's leading mRNA vaccine and therapeutics makers. However, losses were partially offset by gains in a global IP leader in gene-editing technology and a leading life sciences equipment maker.

**Portfolio Inception: December 31, 2010. All returns presented above that are greater than 1 year in length have been annualized. Performance data quoted represents past performance. Past performance does not guarantee future results and current performance may be lower or higher than the data quoted. Please see the final page of this document for additional important disclosures.*

Sierra Club Green Alpha

How our portfolios compare to their benchmark, the MSCI All Country World Investible Market Index

Characteristics

- **Sierra Club® criteria** – the only portfolio available in the market that utilizes the Sierra Club's proprietary, rigorous social and environmental screening criteria
- **Fundamentals-driven:** the underlying quality of companies and the price paid for their shares are key drivers of LT returns
  - ✓ **High growth:** indicated by Sales Growth, and a decrease from Current P/E to Forward P/E as revenue and earnings grow
  - ✓ **Compelling valuation:** demonstrated by Price/Sales and Price/Book metrics relative to growth expectations
  - ✓ **Strong balance sheet and management execution:** conveyed by capital stewardship, LT Debt/Equity, and Current Ratio
- **Fossil fuel free since inception:** we have never invested in companies that prospect, extract, refine, or transport fossil fuels, nor in fossil-fired utilities or internal combustion engine manufacturers
- **Diversified – we seek solutions wherever we can find them:** across the globe, in companies of all sizes, and every industry
- **Public equities, long-only:** most investors' largest asset class; largest opportunity for impact

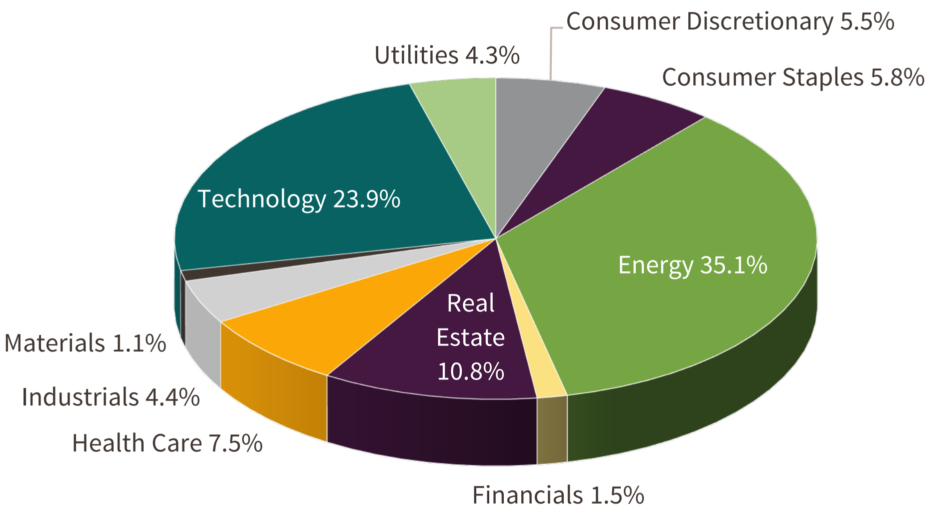
Characteristics	Sierra Club Green Alpha	Benchmark: MSCI ACWI IMI (SPGM)	Next Economy Index	Social Index	Next Economy Select	Growth & Income	DiversiTerra
# of Securities	47	2,488	142	99	63	35	57
Active Share	96%	-	93%	94%	96%	97%	95%
Sales Growth, Trailing 3-Yr	45%	14%	47%	57%	42%	23%	53%
P/E, Current	18.7	16.1	19.8	21.0	16.0	15.9	19.9
P/E, 1-Year Forward	19.8	15.4	20.3	22.1	17.0	16.0	21.7
Price/Sales	1.2	1.6	2.1	2.0	1.6	1.6	1.9
Price/Book	2.4	2.4	3.0	2.8	2.1	1.7	2.6
LT Debt/Equity	95%	138%	105%	92%	93%	63%	97%
Current Ratio	2.7	2.0	3.2	3.8	4.0	2.7	3.2
Dividend Yield	1.46%	2.29%	1.19%	1.10%	1.96%	4.42%	1.46%
Market Cap., Wtd Avg ($B)	$104.71	$326.62	$88.08	$86.65	$103.96	$84.35	$109.88
Market Cap., Median ($B)	$12.65	$2.53	$8.06	$7.76	$3.79	$29.04	$7.41
Turnover, Trailing 2-Yr Avg	21%	Not Available	12%	43%	12%	18%	32%
Beta, Trailing 2-Yrs	1.28	1.00	1.26	1.30	1.26	1.20	1.26
U.S.-Domiciled Companies	68%	57%	76%	84%	65%	66%	80%
% Revenue Derived in U.S.	45%	43%	48%	53%	43%	45%	58%

All characteristics are sourced from FactSet, are based on a representative account and include cash. Please see the final page of this document for additional important disclosures.

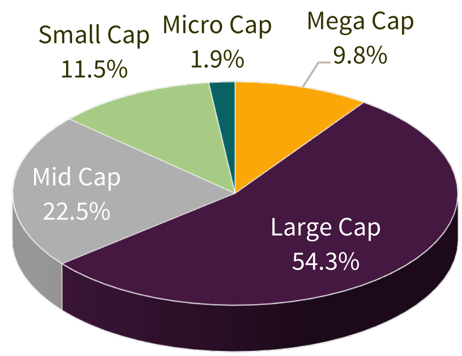
Portfolio Allocations

Our search for Next Economy companies is unconstrained. For the Sierra Club Green Alpha portfolio, we seek solutions to systemic risks wherever they exist – across sectors, market caps, and geographies.

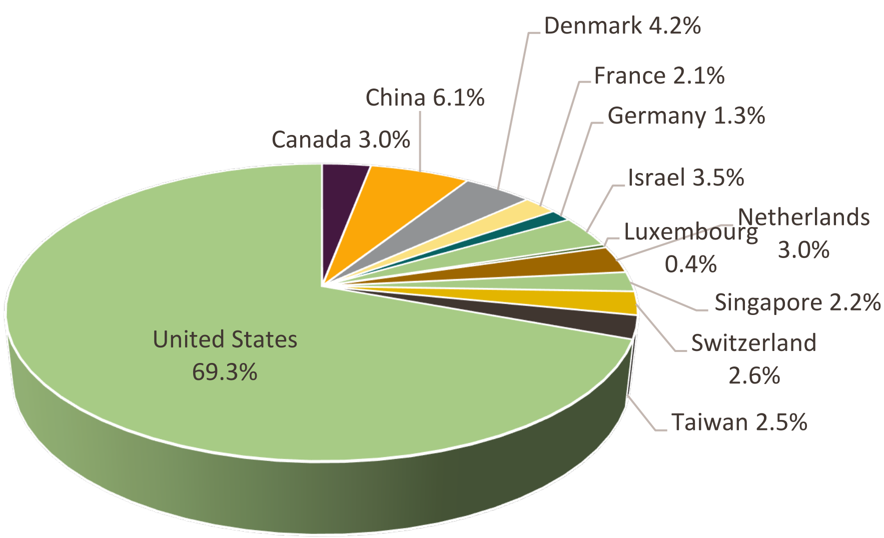
Economic Sectors



Market Capitalizations



Companies' Main Headquarters



Allocation data is sourced from FactSet and is based on a representative account. The exception is the sector chart, which utilizes the Bloomberg Industry Classification Standard from Bloomberg. All charts on this page are shown as percent of equity. Please see the final page of this document for additional important disclosures.

Important Disclosures

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- Performance quoted throughout this document represent past performance. Past performance does not guarantee future results, and current performance may be lower or higher than the data quoted. Investment returns and principal will fluctuate with market and economic conditions, and investors may have a gain or loss when shares are sold.
- Beginning November 30, 2021, the Sierra Club Green Alpha strategy performance results are a composite of discretionary client accounts invested in the strategy on specific custodial platforms. Green Alpha’s discretionary client accounts that are not included in the composite are those custodied at Folio Institutional due to operational limitations of Folio’s data feeds to Green Alpha’s portfolio accounting system Advent APX. The Sierra Club Green Alpha composite performance results reflect actual performance for a composite of discretionary client accounts, net of actual management fees and transaction costs. Some assets managed in the Sierra Club Green Alpha strategy within the composite receive a reduced fee from the standard management fee schedule. Actual client returns experienced will vary from the composite returns based on a variety of factors, and we encourage you to ask about specific factors. Accounts are included in the composite for full-month periods under management with Green Alpha Investments. The Sierra Club Green Alpha performance results do not reflect the reinvestment of dividends and interest.
- Actual advisory fees may vary among clients with the same investment strategy. Green Alpha’s standard fee schedules are available within Form ADV Part 2. For those details and additional legal information, please see information and files here: http://greenalphaadvisors.com/about-us/legal-disclaimers/.
- From the strategy’s inception through November 30, 2021, Sierra Club Green Alpha performance results reflected the actual performance of a representative account, net of actual management fees and transaction costs. Assets managed in the Sierra Club Green Alpha strategy representative account received a reduced fee from the standard fee schedule. Sierra Club Green Alpha representative account performance results did not reflect the reinvestment of dividends and interest. Please contact Green Alpha for information about the representative account selection process.
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- The MSCI All Country World Investable Market Index (ACWI IMI) captures large, mid, and small cap representation across 23 developed markets and 27 emerging markets countries. With more than 8,750 constituents, the index is comprehensive, covering approximately 99% of the global equity investment opportunity set. Investors cannot invest directly in this index.
- The SPDR MSCI Global Stock Market ETF (ticker: SPGM) seeks to provide investment results that, before expenses, correspond generally to the price and yield performance of the MSCI ACWI IMI. Investors can invest directly in SPGM.
- The S&P 500 Index is an unmanaged index of 500 common stocks chosen for market size, liquidity, and industry group representation. It is market-value weighted. The S&P 500 Index figures do not reflect any fees, expenses, or taxes. Investors cannot invest directly in this index.
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