

Sierra Club Green Alpha

December 31, 2024



Green Alpha®

Largest Positions	2
Macroeconomic Commentary	4
Performance and Sector Attribution	5
Portfolio Characteristics	6
Sector, Geographic, and Market Cap Allocations	7
Disclosures	8

Why Invest in Sierra Club Green Alpha?

- Active research, stock selection, and portfolio mgmt
- Leverage Green Alpha's Next Economy™ insights alongside Sierra Club's renowned sustainability criteria
- Gain exposure to 30-50 market leaders solving critical economic and environmental challenges

Inception Date: December 31, 2010

Vehicle: Separately Managed Accounts

Investment Philosophy

The driving forces behind economic growth are:

- companies accelerating productivity, and
- businesses tackling urgent global challenges.

High-performing enterprises can revolutionize efficiency while also developing solutions for critical issues like climate change, resource depletion, social inequality, and public health crises. By doing so, they can create economic expansion and actualize a more sustainable and equitable future. These innovative companies offer the most promising investment opportunities, providing security and growth potential for our clients' capital.

Our strategy is clear: we focus on identifying and investing in businesses that are developing brilliant, scalable, adaptable, and economically viable solutions to global challenges.



Research

We select companies for our portfolios based on:

- *Impact:* Businesses offering innovative solutions to critical economic, environmental, and other global challenges.
- *Innovation Leadership:* Companies investing heavily in R&D, intellectual property, and capital expenditures.
- *Strong Management:* Diverse, effective teams aligned with shareholders, demonstrating revenue growth, expanding profit margins, and potential dividend increases.
- *Financial Health:* Businesses with robust balance sheets and smart capital allocation strategies.
- *Value:* Companies whose stock prices offer attractive value relative to proven performance and growth prospects.

These and other factors help us construct portfolios that aim for strong returns and build a more sustainable economy. We concentrate on long-term success in an evolving landscape.

Portfolio Construction

Green Alpha has exclusive rights to combine Sierra Club's stringent environmental and social criteria with our Next Economy™ approach. This unique collaboration ensures:

1. Forward-looking alignment with Sierra Club's vision
2. Historical compliance with their rigorous guidelines
3. Selection of high-impact companies driving sustainability

Every holding represents a cutting-edge solution actively shaping the transition to a sustainable economy. Our portfolio not only anticipates future trends, but also upholds a proven track record of environmental and social responsibility, as validated by Sierra Club's exacting standards.

Largest Positions

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

Taiwan Semiconductor Manufacturing *(Sector: Technology, Industry: Semiconductors)*

- TSMC is the world's leading semiconductor foundry, providing essential manufacturing services for advanced logic chips. The company's clients include industry giants such as Apple, NVIDIA, and Qualcomm, who rely on TSMC's cutting-edge technology to produce their most sophisticated products. Strengths include:
 - *Technological Leadership:* TSMC currently operates at the 2nm node — the most advanced process technology globally. This leadership is driven by early adoption of innovative techniques like extreme ultraviolet lithography (EUV).
 - *Unmatched Scale and Efficiency:* TSMC's massive scale translates to unparalleled production efficiency, contributing to lower costs for electronic devices worldwide.
 - *Strategic Importance:* TSMC plays a critical role in the global technology ecosystem. Its ability to translate leading-edge chip designs into reality makes it an indispensable partner for companies driving innovation.
 - *Market Dominance:* With over 90% market share in advanced foundry services, TSMC's operational excellence and consistent delivery of new process nodes have solidified its position as the "state of the art" in the industry.
- TSMC's location in Taiwan places it at the center of US-China strategic competition in the technology sector. This geopolitical reality has significant implications for supply chain stability and government policies.
- TSMC invests significantly in R&D and capacity expansion to maintain its technological edge and meet growing global

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

- JinkoSolar is a top-tier global solar panel manufacturer.
 - *2023 Shipments:* JinkoSolar shipped 78.5 GW of solar modules in 2023, marking a 76.4% year-over-year increase.
 - *2024 Projections:* The company anticipates shipping between 100 GW and 110 GW of solar modules in 2024.
 - *Production Capacity:* JinkoSolar aims to achieve an annual production capacity of 130 GW by the end of 2024.
- They are investing in R&D to further improve the efficiency and stability of perovskite solar cells, exploring:
 - *Full-area Passivated Contact Tech:* This helps to reduce recombination losses and improve charge collection.
 - *Perovskite Interfacial Defect Passivation Technology:* This addresses defects at the interface between the perovskite and silicon layers, which can hinder performance.
 - *Bulk Defect Passivation Technology:* This focuses on reducing defects within the perovskite layer itself.
 - *High Efficiency and Advanced Technology:* Renowned for its high-efficiency solar panels, particularly those using n-type TOPCon technology, they have achieved a remarkable 25.42% efficiency for their 182 mm TOPCon module.
 - *High Efficiency Perovskite-Silicon Tandem Cells:* JinkoSolar has achieved remarkable efficiencies with perovskite-silicon tandem solar cells. They've reached a 33.84% conversion efficiency for a perovskite tandem cell based on n-type TOPCon technology, surpassing their previous record of 33.24%.
- JinkoSolar is committed to sustainability and responsible practices, excelling in areas such as:
 - *Extended Producer Responsibility:* Taking responsibility for the end-of-life management of their products.
 - *Supply Chain Transparency:* Providing transparency about their supply chain and working conditions.
 - *Chemical Management:* Implementing safe and responsible chemical handling practices.

Company Name	Ticker	Weight
Taiwan Semiconductor Manufacturing	TSM	7.05%
JinkoSolar Holding	JKS	4.93%
SL Green Realty	SLG	4.12%
Brookfield Renewable	BEPC	3.85%
Qualcomm	QCOM	3.43%
% of Portfolio		23.38%

SL Green Realty, Brookfield Renewable, and Qualcomm's Next Economy attributes are continued on the following page.

Largest Positions *continued*

SL Green Realty (Sector: Real Estate, Industry: REIT)

- SL Green is a fully integrated real estate investment trust (REIT) specializing in the acquisition, management, and development of commercial properties, in New York City's Manhattan borough. SL Green owns and operates an impressive portfolio of iconic and high-quality office buildings in prime locations.
- *Adaptive Strategies:* SL Green has shown adaptability in responding to market changes, including the shift in office use patterns following the COVID-19 pandemic.
- SL Green is committed to sustainability and has implemented numerous green initiatives across its portfolio:
 - *Science-Based Targets:* SLG has committed to emissions reduction targets aligned with the Science Based Targets initiative (SBTi), demonstrating their ambition in combating climate change.
 - *Renewable Energy:* SLG actively pursues renewable energy sources, both through on-site installations and by purchasing renewable energy credits.
 - *Energy Efficiency Upgrades:* SLG extensively invests in energy-efficient retrofits of their buildings. This includes lighting upgrades, HVAC optimization, and building envelope improvements.
 - *Conservation:* They implement water-saving measures in their properties, reducing their environmental footprint.

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

- Brookfield owns and operates a portfolio of solar, wind, hydroelectric power generation, and energy storage facilities across North America, South America, Europe, and Asia. As one of the largest publicly traded renewable power platforms, they boast more than 8,000 power generating facilities, with installed capacity surpassing 35,000 megawatts and its development pipeline stands at approximately 200,000 megawatts.
- *Scale:* Brookfield Renewable is one of the world's largest publicly traded renewable power platforms, with significant capacity and a growing presence in key markets.
- *Growth:* They have a strong track record of both organic growth and strategic acquisitions.
- *Innovation:* They are actively involved in emerging technologies like energy storage and distributed generation.
- Known for its conservative management, Brookfield seeks strategic acquisitions at attractive valuations while fostering organic growth to expand its generation capacity. Their revenues are largely secured through long-term power purchase agreements (PPAs), providing stability and predictability to cash flows. Notably, their business model exhibits resilience in the face of inflation, as its costs remain fixed while its PPAs are indexed to inflation.

Qualcomm (Sector: Technology, Industry: Semiconductors)

- Qualcomm is a global leader that develops and commercializes foundational technologies for the wireless industry. They are known for their expertise in wireless communication, semiconductor design, and software development.
- *Wireless Leadership:* Qualcomm is at the forefront of wireless technology development, driving innovation in 5G, Wi-Fi, and next-generation cellular connectivity. This expertise positions them as a key enabler of the future of communication.
- *Semiconductor Excellence:* Qualcomm's Snapdragon processors are industry-leading, powering a wide array of mobile and IoT devices with high performance and energy efficiency. This dominance in the semiconductor market is a significant asset.
- *Global Connectivity:* Qualcomm's technologies connect billions of people and devices worldwide, facilitating communication, commerce, and information access on a global scale.
- *Diversified Portfolio:* Their portfolio extends beyond mobile to encompass automotive, healthcare, and industrial sectors. This diversification fuels innovation in autonomous driving, connected healthcare, and smart city infrastructure.
- *Commitment to R&D:* Qualcomm maintains a strong focus on R&D, fostering a culture of innovation. This commitment ensures they remain at the cutting edge of technological advancement and contribute to future industry growth.

Please see the final page of this document for important disclosures about portfolio, benchmark, and characteristic information.

Macroeconomic Commentary



In 2024, the pace and magnitude of change became more extraordinary. The interplay of climate transition, geopolitical dynamics, and technological advancement continues to reshape the investment landscape at an unprecedented rate. Successfully navigating these transformative forces requires both adaptability and disciplined risk management. And amid the complexity, we find compelling evidence of human ingenuity and progress that creates meaningful investment opportunities.

In Green Alpha's macroeconomic commentary, we examine how these transformational forces are reshaping our world, and what they mean for long-term investors. This page includes brief summaries; you can find the article [here](#).

Market Environment

Global markets navigated significant challenges in 2024 amid persistent inflation, geopolitical tensions, and unprecedented climate impacts. Despite these headwinds, markets demonstrated resilience as inflation moderated without triggering a recession. Key risks remain, particularly around trade policies, government debt levels, and demographic shifts in major economies.

Macroeconomic Trends

Aging populations in Europe, Japan, and China continue to pressure fiscal sustainability and labor markets. The U.S. faces similar demographic headwinds, with declining worker-to-retiree ratios threatening entitlement programs. Government debt levels and higher interest rates may force continued austerity measures across developed markets in 2025.

Sector Transformation

The energy sector is undergoing structural change as renewables achieve cost advantages over traditional sources. Solar deployment accelerated in 2024, and battery costs fell to below \$100/kWh. This technological shift suggests continued margin pressure on traditional energy assets while creating opportunities in the renewable supply chain.

Technology & Innovation

Artificial intelligence deployment accelerated across sectors, driving productivity gains and margin expansion. Notable developments in biotechnology, particularly in multi-omics and AI applications, are creating new addressable markets in healthcare, agriculture, and materials. These innovations present both opportunities and disruption risks across portfolios.

Investment Implications

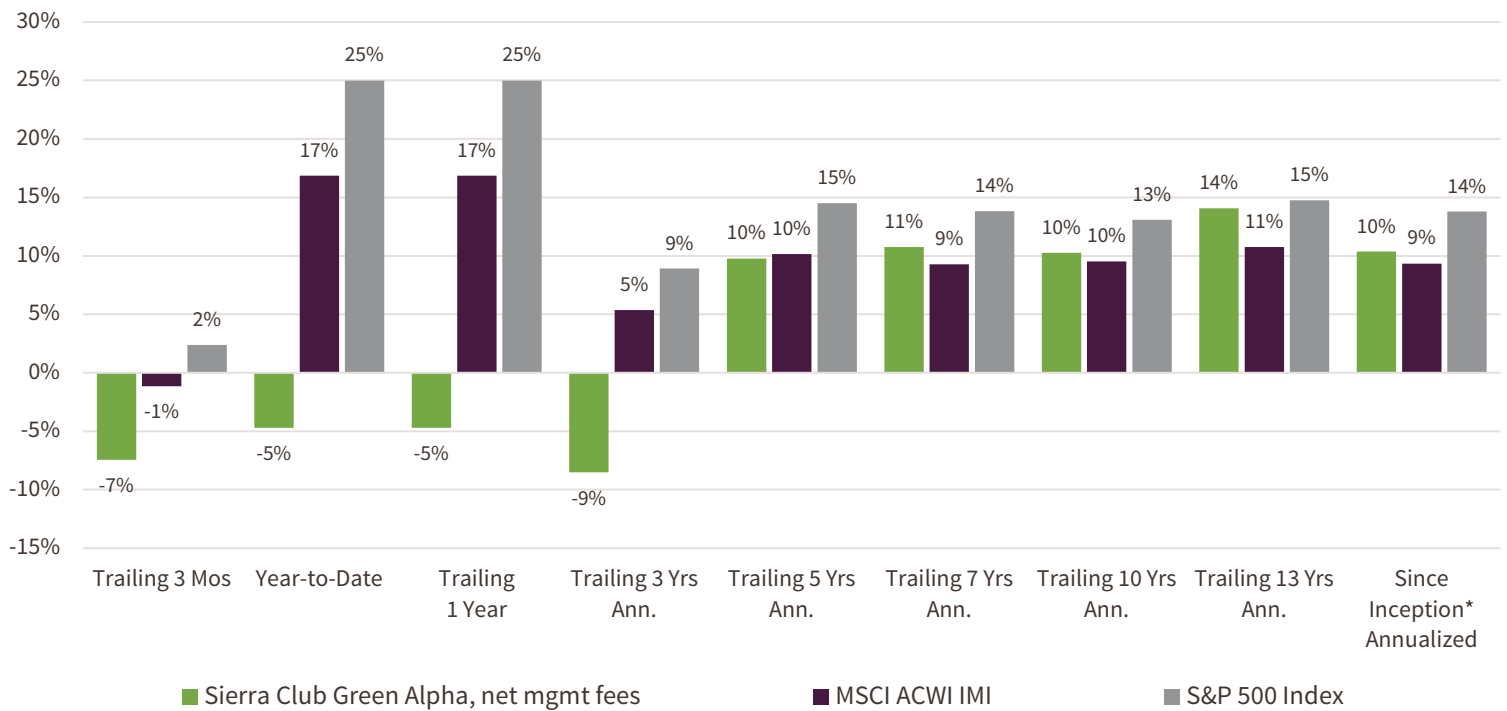
The pace of technological change and climate transition demands portfolio flexibility and careful risk management. We see compelling opportunities in:

- Companies leveraging AI for operational efficiency
- Renewable energy supply chain leaders
- Biotechnology innovators with strong intellectual property positions
- Firms successfully navigating demographic shifts

While macroeconomic headwinds persist, technological advancement continues to create attractive secular growth opportunities for long-term investors. The rapid pace of innovation across these sectors presents significant investment opportunities despite climate challenges. Success requires unprecedented market flexibility and institutional adaptation as the world undergoes transformative change.

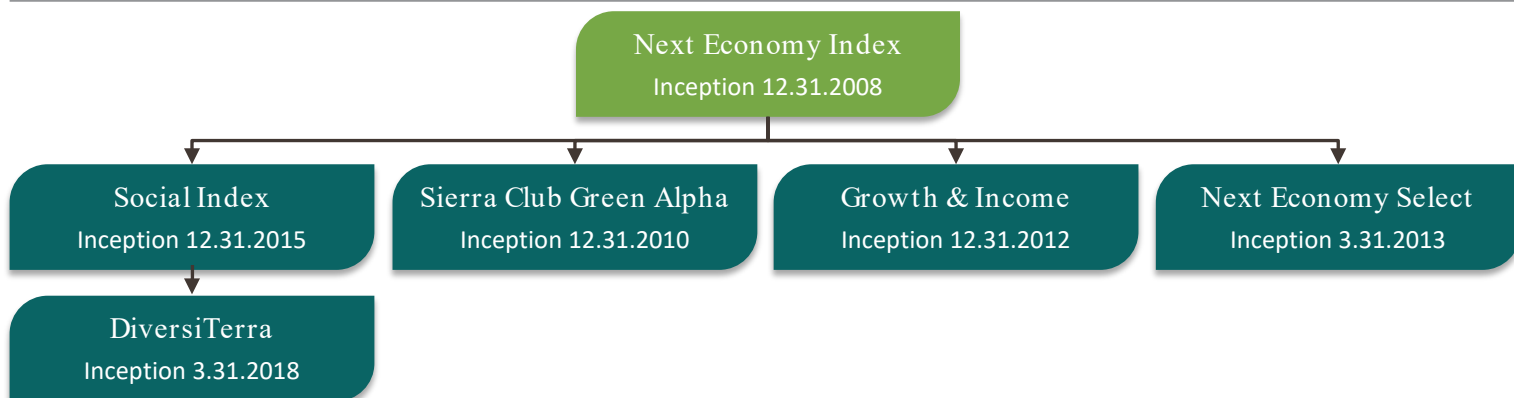
Full content: <https://greenalphaadvisors.com/2024-macro-commentary-next-economy-forces-reshaping-markets/>

Portfolio Performance & Attribution



Year-to-Date Sector Attribution by Bloomberg Industry Classification Standard	Average Weight (%)		Total Return (%)			Contribution to Return (%)		
	Portfolio	MSCI ACWI IMI (SPGM)	Portfolio	MSCI ACWI IMI (SPGM)	+/-	Portfolio	MSCI ACWI IMI (SPGM)	+/-
Consumer Staples	10.81	6.43	114.82	6.50	108.32	8.05	0.48	8.27
Technology	26.82	22.98	8.21	30.58	-22.37	2.28	6.56	-3.83
Consumer Discretionary	6.76	10.16	28.96	16.77	12.19	1.85	1.67	0.39
Utilities	3.53	2.10	1.39	12.65	-11.26	0.07	0.27	-0.20
Cash	1.72	0.65	0.00	5.53	-5.53	0.00	0.07	-0.06
Materials	3.60	4.51	-6.61	-6.74	0.13	-0.18	-0.31	0.13
Industrials	3.01	11.15	-8.86	13.10	-21.96	-0.25	1.49	-1.72
Financials	1.96	16.42	-22.79	26.48	-49.27	-0.43	4.15	-4.56
Real Estate	15.43	2.14	-5.71	-0.63	-5.08	-1.00	-0.03	-1.03
Health Care	7.28	11.22	-51.54	2.00	-53.54	-5.28	0.38	-6.10
Energy	19.10	4.53	-37.51	-3.55	-33.96	-8.90	-0.12	-9.72
Communications	0.00	8.15	0.00	30.15	-30.15	0.00	2.31	-2.27
Government	0.00	0.05	0.00	1.37	-1.37	0.00	0.00	0.00

*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. The sector attribution table is supplemental to the fully compliant composite returns presented at the top of the page. Please see the final page of this document for additional important disclosures.



- **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, Current Ratio
- **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, so their largest opportunity for impact
- **Fossil fuel free since inception:** we never invest in companies that prospect, extract, refine, or transport fossil fuels, nor in fossil-fired utilities or internal combustion engine manufacturers

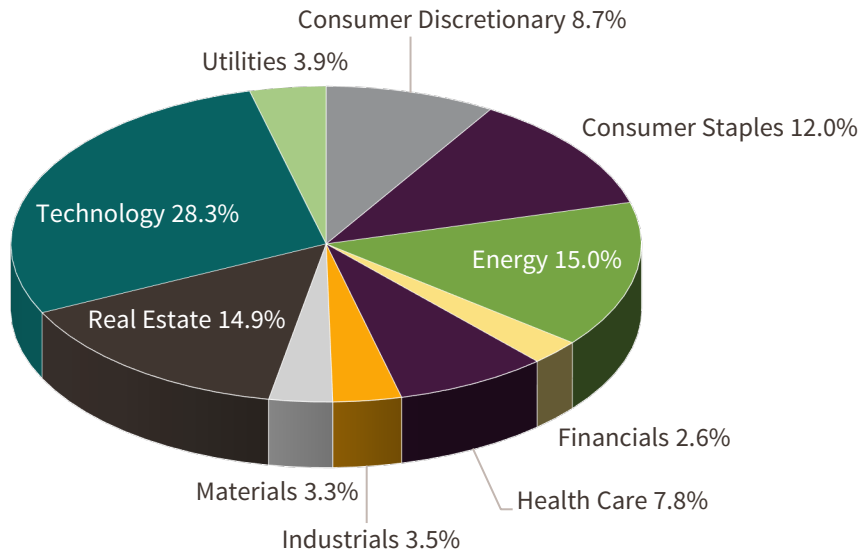
Characteristics	Sierra Club Green Alpha	Benchmark: MSCI ACWI IMI (SPGM)	Next Economy Index	Social Index	Next Economy Select	Growth & Income	DiversiTerra
# of Securities	49	2,691	152	113	57	36	56
Active Share vs SPGM	98%	-	91%	94%	97%	96%	94%
Active Share vs Next Economy Index	70%	-	-	36%	68%	75%	68%
Sales Growth, Trailing 3-Yr	27%	16%	34%	40%	25%	23%	33%
P/E, Current	30.0	21.6	30.4	29.0	27.5	26.0	32.8
P/E, 1-Year Forward	21.0	18.9	25.6	24.5	22.3	16.9	23.9
Price/Sales	0.7	0.3	2.0	2.3	1.4	1.0	2.2
Price/Book	1.6	0.3	2.3	2.1	2.1	1.4	2.6
LT Debt/Equity	69%	84%	70%	85%	71%	227%	57%
Current Ratio	3.9	2.6	3.4	3.8	4.6	4.2	3.3
Dividend Yield	2.23%	1.86%	1.01%	1.08%	2.01%	4.25%	1.35%
Market Cap, Wtd Avg (\$B)	\$105.88	\$680.55	\$162.15	\$109.05	\$138.32	\$138.71	\$212.64
Market Cap, Median (\$B)	\$5.66	\$2.81	\$7.73	\$11.67	\$5.24	\$16.41	\$6.34
Turnover, Trailing 2-Yr Avg	15%	Not Available	25%	36%	20%	13%	17%
Beta, Trailing 3-Yrs	1.45	1.00	1.41	1.52	1.50	1.34	1.45
U.S.-Domiciled Companies	70%	63%	81%	89%	70%	70%	84%
% Revenue Derived in U.S.	53%	45%	52%	62%	52%	54%	58%

Characteristics are sourced from FactSet, based on a representative account and include cash. Please see additional disclosures on last page.

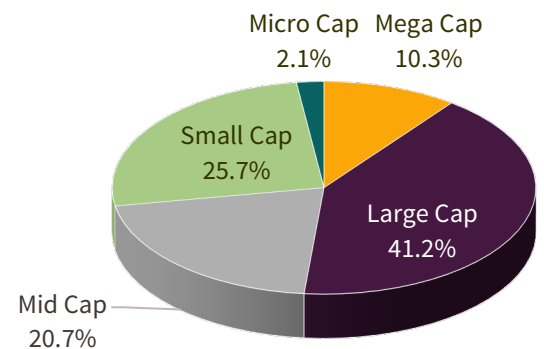
Portfolio Allocations

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.

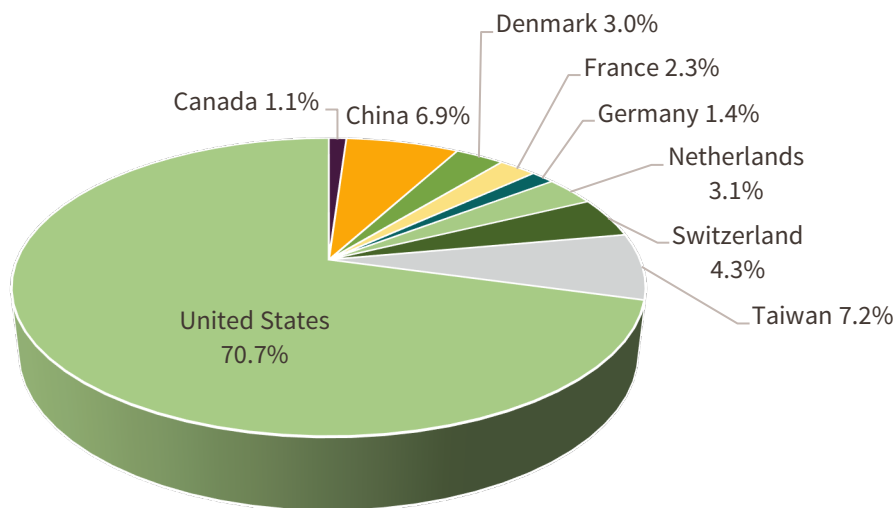
Sectors



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

- Green Alpha Advisors, LLC is a registered investment advisor. Registration as an investment advisor does not imply any certain level of skill or training.
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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. Beginning May 31, 2023, composite membership also includes a minimum account size of \$25,000. The Sierra Club Green Alpha composite performance results reflect actual performance for a composite of discretionary client accounts meeting custodian and minimum account size requirements. 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) is a free float-adjusted market capitalization-weighted index that is designed to measure the combined equity market performance of developed and emerging markets. The Index covers approximately 99% of the global equity investment opportunity set. The MSCI ACWI IMI figures do not reflect any fees, expenses, or taxes. 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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