

Sierra Club Green Alpha

December 31, 2022



Green Alpha[®]

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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.



Why Invest in Sierra Club Green Alpha?

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

Inception Date: December 31, 2010

Vehicle: Separately Managed Accounts

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 investment 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

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. FSLR uses 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.
- 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.
- Under the recently passed Inflation Reduction Act, First Solar could earn as much as 17 cents per watt in subsidies—the highest in the industry, and more than half of their reported production cost per watt.
- 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.
- JKS's solar module production capacity is projected to reach 65 GW by fiscal year-end 2022. Of the top five manufacturers, JKS alone has grown its global module market share in the last year, ranking number one in global shipments for the past four years. In Q3, revenues were up 127% YoY, quarterly shipments were 10.3 GW, up 117.4% YoY, extending the company's market share lead.
- 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.

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, Moderna, and Enphase Energy's Next Economy attributes are continued on the following page.

Company Name	Ticker	Weight
First Solar	FSLR	5.83%
JinkoSolar Holding	JKS	5.28%
Vestas Wind Systems	VWDRY	4.55%
Moderna	MRNA	4.09%
Enphase Energy	ENPH	4.03%
% of Portfolio		23.78%

Largest Positions *continued*

Vestas Wind Systems *continued*

- Vestas' order intake velocity, always strong, accelerated as of Q2, 2022: 2.9 GW in new 2022 orders, pushing delivery dates to 2024, giving good transparency into revenue growth. In Q3 2022, order intake slowed to 1.9GW in new orders, a slowdown that the company attributes to geopolitical concerns. Total order backlog is 49.5 billion Euros and service order backlog is 4.8 billion Euros. While new order intake has slowed because of project delays, the service business 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.
- The board is 42% female. Women serve on all committees and comprise half of the Nomination & Compensation Committee.

Moderna (Sector: Health Care, Industry: Biotech & Pharma)

- Discovery-to-clinical-stage biotech focused on using messenger RNA to develop and deploy therapies and vaccines. Moderna's revolutionary science has existing and potential applications for many areas, including oncology, infectious and cardiovascular diseases.
- Robust early-and-advanced stage pipeline means future growth may be impressive even excluding revenues from their COVID-19 vaccine, although the vaccine has accelerated their time to profitability as well as their ability to fund further research and trials. Interesting vaccines in their pipeline include those for HIV and CMV. Moderna is not just pioneering new medicines, but *new categories* of medicines, potentially transforming medicine overall.
- The Q4 2022 announcement of a partnership with Merck to develop personalized cancer vaccines is a positive indication of a potential forward revenue driver. In addition, Moderna is running 33 development programs, including 26 in the clinic, showing both broad and deep product potential.
- Moderna's executive team exhibits good diversity, with four female Chief-level officers making up 36% of the group. In addition, the board includes three women, two of whom chair the Audit and Product Development Committees.

Enphase Energy (Sector: Energy, Industry: Renewable Energy)

- Enphase Energy is the world's leading supplier of solar microinverters, completing all-in-one solar panel systems for residential and commercial use. Enphase pioneered semiconductor-based microinverters for DC/AC conversion and paired with proprietary network and software technology, resulting in advanced energy monitoring and control.
- Recently, Enphase extended its business into the fast growth markets of battery energy storage and EV charging stations, both of which benefit from its smart inverter expertise. All Enphase systems with microinverters and batteries use the IQ System Controller device, which automatically detects and switches from grid power to backup battery in the case of a power outage.
- The company has installed more than 48 million microinverters on over 2.7 million homes in over 145 countries, shipped over 17 GW of DC microinverters, and provided over 693 MWh of storage.
- Females comprise 25% of Enphase's executive team, including the CFO, CMO, and General Counsel. Importantly, both the executive team and board of directors have significantly above-average age spreads of 38 years.

Macroeconomic Commentary



The world, and economy, were complex and volatile throughout 2022. In Green Alpha's [signature investing style](#)—combining macro trajectory analysis, identification of problem-fixing companies, fundamental data, and active, benchmark-agnostic portfolio construction—we helped our clients gain market exposure to the Next Economy.

Investing in what's next (as opposed to what was) means valuing innovation and extrapolating the world economy as it is today into what it is likely to become over the next five to ten years. Within that longer-term context, it can be a challenge to make sense of current events, from geopolitical flare-ups to stock market turmoil. If one's investing time frame is a year or two, strategies aimed at the growth of the Next Economy may feel volatile. And indeed, most of our strategies underperformed their benchmark index for the year.

Throughout 2022, inflation remained high and interest rates climbed globally. Tied to the looming threat of recession, stocks have been broadly down, and some sectors have been hit harder than others. Many of the sectors in which companies' share prices dropped the most are within our sphere of interest to invest in and benefit from long-term trends and opportunities. Please see page 7 for portfolio-specific attribution results for the year, as well as since-inception performance numbers.

2022 Macroeconomic Highlights

This year proved that people can collectively coordinate to solve real problems. Within Europe, in 2022 alone, natural gas usage was [down between 21% and 35%](#), depending on the country, while [solar generation capacity was up 47%](#). Surely this shows that people and nations *can* come together to more rapidly decarbonize world energy systems, if properly motivated.

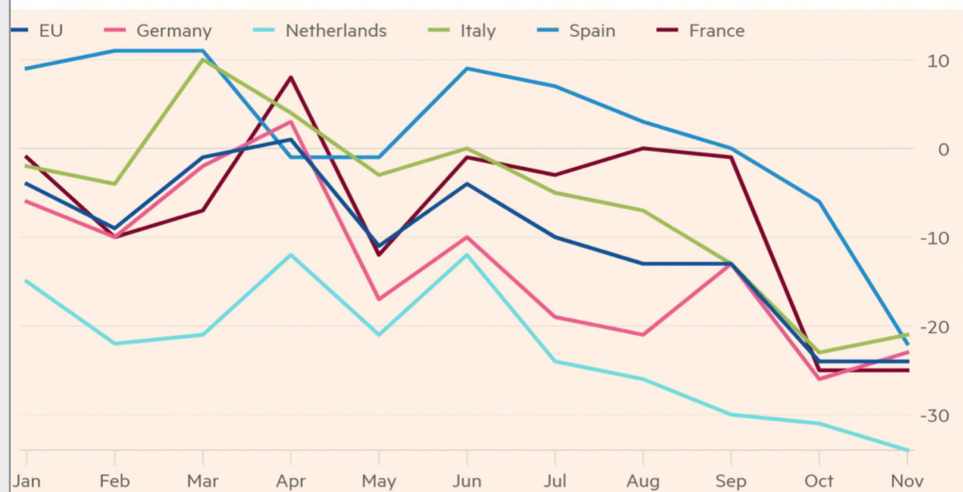
In genomics, 2022 saw [dramatic evidence](#) that one-time therapeutics can treat some types of cancer, a vaccine to prevent malaria became available (and is [already in use](#)), and universal flu and RSV vaccines were developed. 2023 promises more next-gen vaccines.

In space, the James Webb Telescope and the Double Asteroid Redirection Test ([DART](#)) mission were historic advancements in human capabilities and research processes. Artificial intelligence [advanced its capabilities](#) dramatically with clear implications for large-scale problem solving and economic productivity acceleration. Quantum computing, as it has the last several years, continued to make progress toward more generalized usefulness and commercial applications.

Gas demand in Europe drops



Reduction vs five-year average %



Source: Financial Times via <https://www.exponentialview.co/>

Macroeconomic Commentary *continued*

The ultimate synergies that will emerge between AI, machine learning, and quantum computing could make this year's headlines around [Chat GPT](#) and [DALL·E 2](#) seem relatively minor.

So, innovation is accelerating, renewable energies are proliferating, medicine is in unprecedented territory, AI is becoming more powerful, and the groundwork is being laid to set the stage for ever more dramatic and rapid progress.

And yet, these accomplishments are not equaled in the realm of policy. In spite of ambitious agreements signed at 27 COPs, 2022 saw a historic, [new record](#) level high of carbon emissions. [According to the IPCC](#), whose language must be unanimously approved by a very conservative group of [195](#) nations, "policies currently in place point to a 2.8°C temperature rise by the end of the century. Implementation of the current pledges will only reduce this to a 2.4-2.6°C temperature rise by the end of the century." If we ask ourselves why the mismatch between political ambition and reality, it comes down to investments. Not enough capital has been directed toward the fixes to the climate crisis, and too much continues to be poured into fossil fuels-oriented sectors and companies.

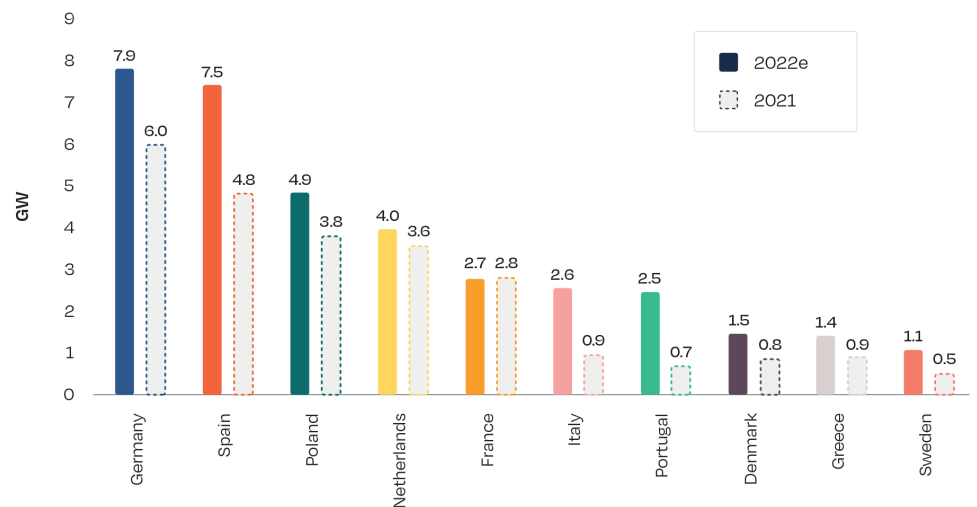
Green Alpha Investments in 2022

The world today is a constantly, rapidly, and dynamically changing environment; and therefore, Green Alpha is continually evolving our portfolio strategies to ensure best alignment with our thesis. This year, we continued to refine our methodologies and approach to address concepts, such as, but not limited to, more emphasis on social cohesion, equity, equality, and diversity of leadership. We also worked to improve our understanding of and exposure to food systems, from farms and manufacturing to packaging and grocery store distribution. We continued our focus on identifying leaders in advanced biotech, with the understanding that this is a [truly transformative](#) moment in that field, and for the global economy. Property development and management have always posed investment challenges for us; this year we renewed our focus on finding and investing in the REITs that are doing more to solve sustainability challenges than to cause them, while exhibiting excellent fundamentals and returning an above-market dividend. The application of our thesis is refined continually as we hone our objectives and turn those into investment actions.

Green Alpha Investments in 2023 and Beyond

For 2023, Green Alpha is evaluating economic conditions based on first, clear evidence that innovation is increasing both economic productivity and environmental sustainability, and second, with the sober awareness that the world

EU27 TOP 10 SOLAR PV MARKETS 2021-2022



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Macroeconomic Commentary *continued*

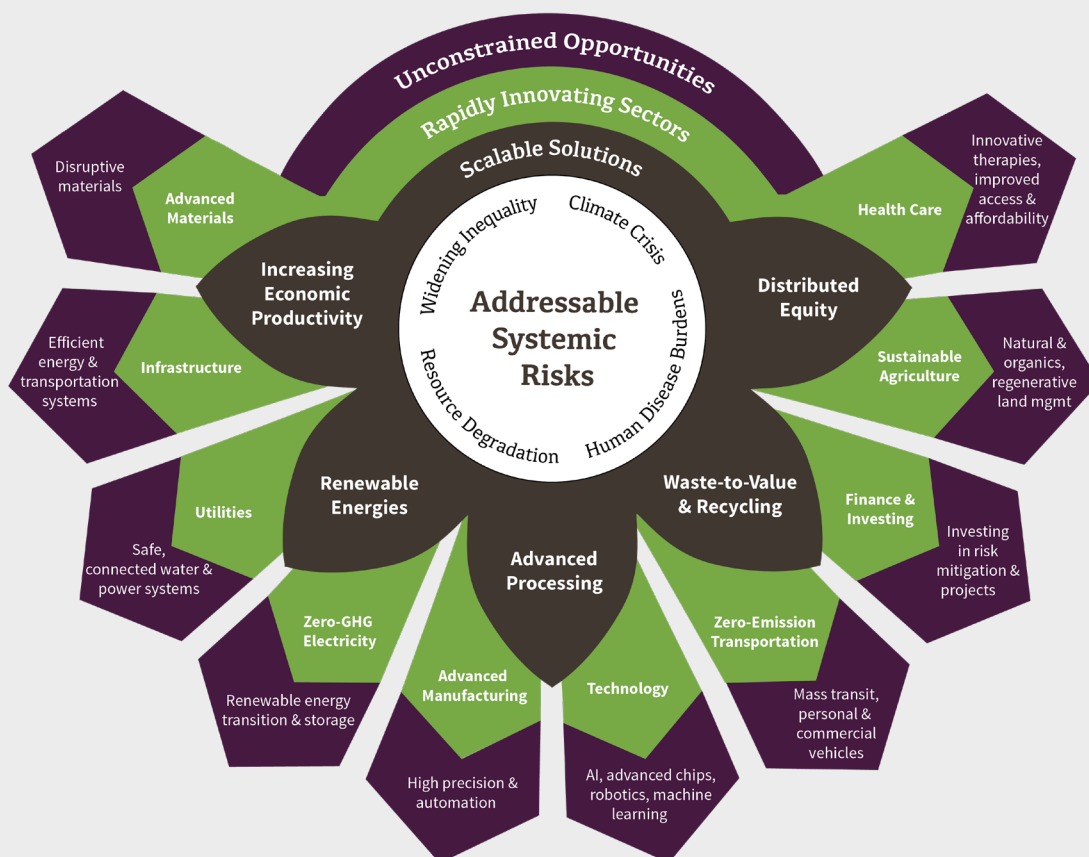
is in many ways still failing to affect sustainability transitions rapidly enough to prevent irreversible, deleterious outcomes. Within those dynamics, we look for opportunities to invest for long-term growth and maximum impact.

As an industry, asset management continues to be overwhelmingly backward-looking, investing in industries that have been important historically, but have far less relevance now and in the future. The desire to change and update the status quo is the source of our long-term competitive track records and is also one of the reasons we founded Green Alpha. The general idea that the economy 10 years hence will essentially be the same economy of 10 years ago is a major market inefficiency. The market of the last 1.5 years, sometimes called a “risk-off market environment,” is a manifestation of that inefficiency, wherein things like potential cures for disease and limitless, very cheap energy have been oversold, in deference to fossil fuels and other 19th century technologies.

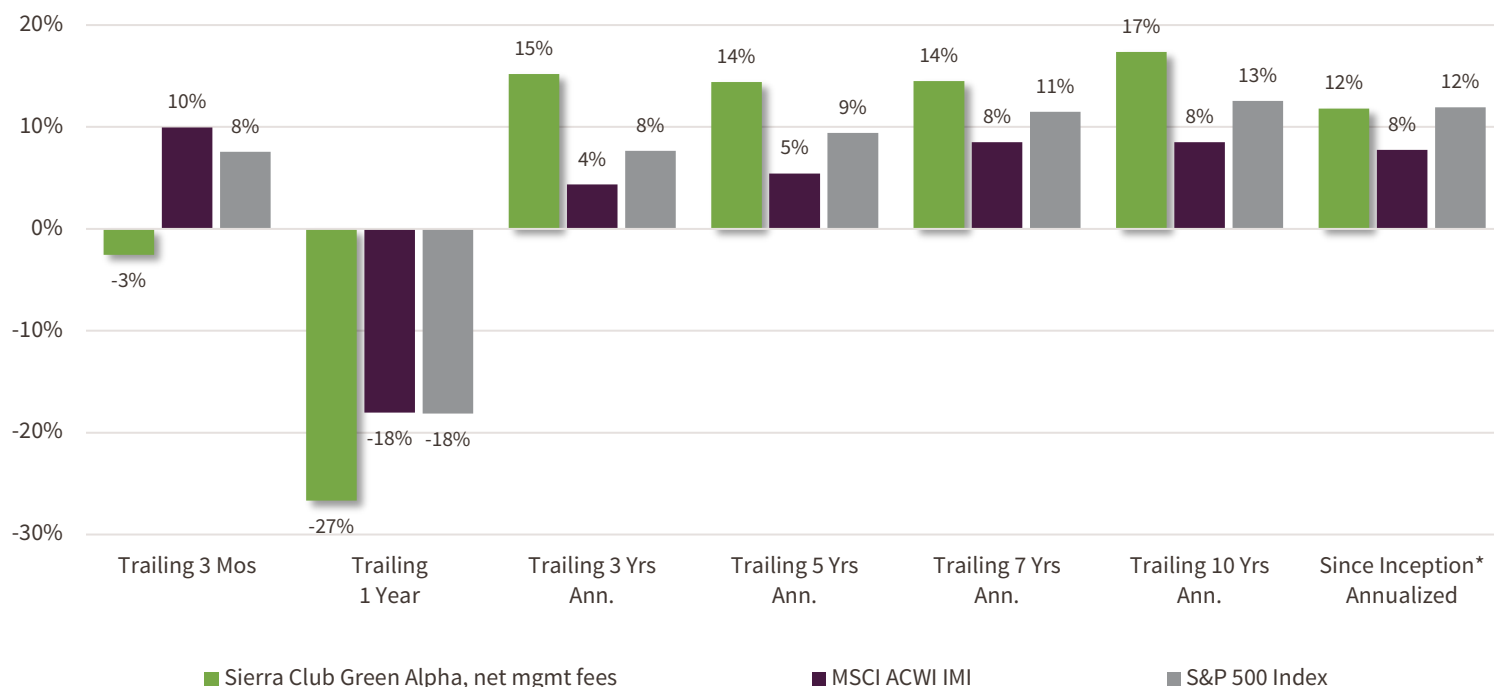
Green Alpha’s Investment Philosophy in Action

We believe that, over time, a company with superior outcomes will see those results reflected in their market returns. Therefore, we refuse to change direction or wander into style drift in the face of downward volatility. On the contrary, we understand that the best time to buy high conviction companies is when they are trading at a discount.

Stocks benefitting from multiple tailwinds, and trading at reasonable prices, will continue to be our focus, even though—and even because—this does not correlate with today’s short-term market orientation. The time horizon mismatch between our investment approach and the markets’ is ultimately okay: we are simultaneously disappointed in a year of underperformance and excited by the opportunity to invest in compelling Next Economy companies at steep discounts relative to the future results we expect from them. To our clients and partners who share our vision, please accept our sincere appreciation. See you in 2023.



Portfolio Performance & Commentary



For the full year 2022, the Sierra Club Green Alpha strategy returned -26.6% net of management fees, versus its benchmark, the MSCI All Country World Investable Market Index (MSCI ACWI IMI), which returned -18.0%. In short, 2022 was a classic manifestation of a “risk-off market environment,” which does not favor Green Alpha’s investment style of focusing on innovation as the key to solving problems, growing the economy, and raising standards of living.

The sectors detracting the most from the strategy’s returns were Technology and Consumer Discretionary.

- There was really no area within the Technology sector that performed well in 2022, with losses coming from the technology hardware and semiconductors, semiconductors, and software industries. A leading designer of chips for mobile communications led declines due to a combination of inflation pressures and supply chains issues. Other companies contributing to losses were in upstream semiconductor equipment manufacturing and foundry services. In software, declines were led by application software and infrastructure software.
- The Consumer Discretionary sector saw losses from consumer discretionary products and automotive manufacturing industries. Manufacturing across the board—from furniture to sustainable flooring to electrical vehicle manufacturing—all experienced significant inflationary and supply chain headwinds.

The strategy’s best performing sectors were Communications and Energy.

- Communications sector gains were provided by the acquisition of a sustainably-run, 100% renewable energy powered data center company.
- Energy was the second largest contributing sector in the portfolio, with gains coming from renewable energy equipment manufacturing, specifically thin film module manufacturing and two leading providers of solar inverters.

**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

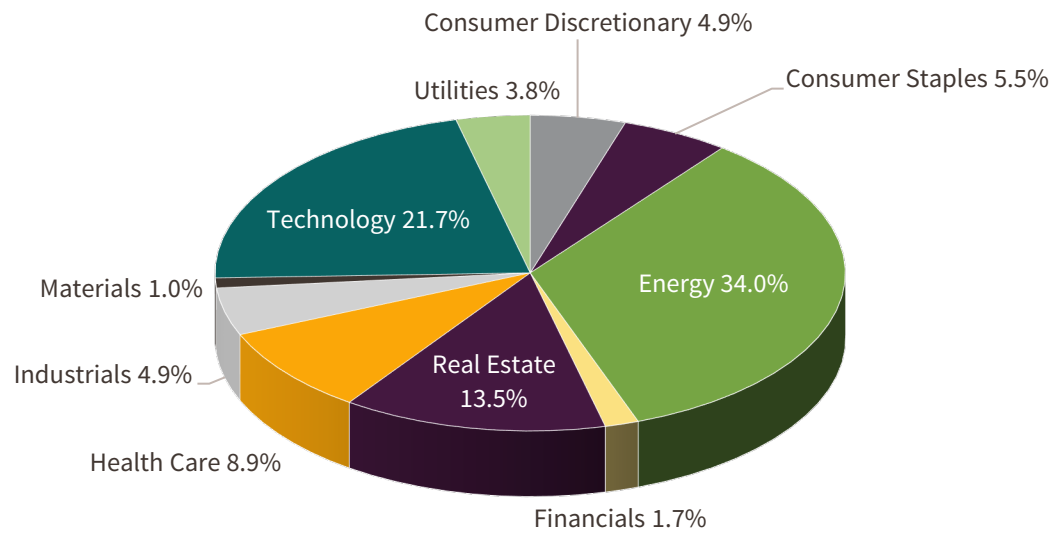
Characteristics	Sierra Club Green Alpha	Benchmark: MSCI ACWI IMI (SPGM)	Next Economy Index	Social Index	Next Economy Select	Growth & Income	DiversiTerra
# of Securities	47	2,488	142	100	62	35	57
Active Share	97%	-	94%	95%	97%	97%	96%
Sales Growth, Trailing 3-Yr	44%	10%	36%	30%	43%	23%	43%
P/E, Current	18.8	14.2	16.1	17.5	15.3	14.8	18.1
P/E, 1-Year Forward	17.7	13.8	16.5	19.0	14.2	15.3	18.6
Price/Sales	1.3	1.7	2.0	2.0	1.7	1.6	1.9
Price/Book	2.3	2.3	2.7	2.6	2.1	1.7	2.7
LT Debt/Equity	70%	169%	120%	101%	71%	59%	124%
Current Ratio	2.8	2.4	3.4	3.8	4.5	2.9	3.2
Dividend Yield	1.61%	2.37%	1.31%	1.20%	2.07%	4.59%	1.50%
Market Cap., Wtd Avg (\$B)	\$73.44	\$261.38	\$60.81	\$59.18	\$75.53	\$66.85	\$78.74
Market Cap., Median (\$B)	\$9.96	\$2.06	\$8.34	\$8.56	\$4.59	\$29.07	\$5.68
Turnover, Trailing 2-Yr Avg	20%	Not Available	32%	39%	17%	19%	31%
Beta, Trailing 2-Yrs	1.12	1.00	1.15	1.21	1.11	1.16	1.15
U.S.-Domiciled Companies	69%	57%	76%	85%	68%	70%	81%
% Revenue Derived in U.S.	47%	43%	49%	55%	47%	48%	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.

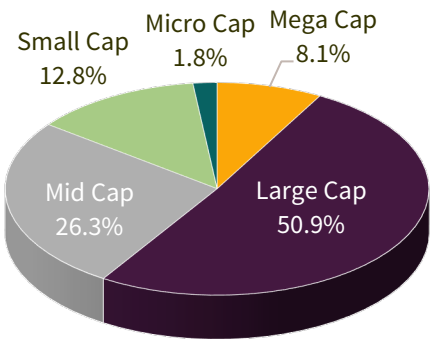
Portfolio Allocations

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.

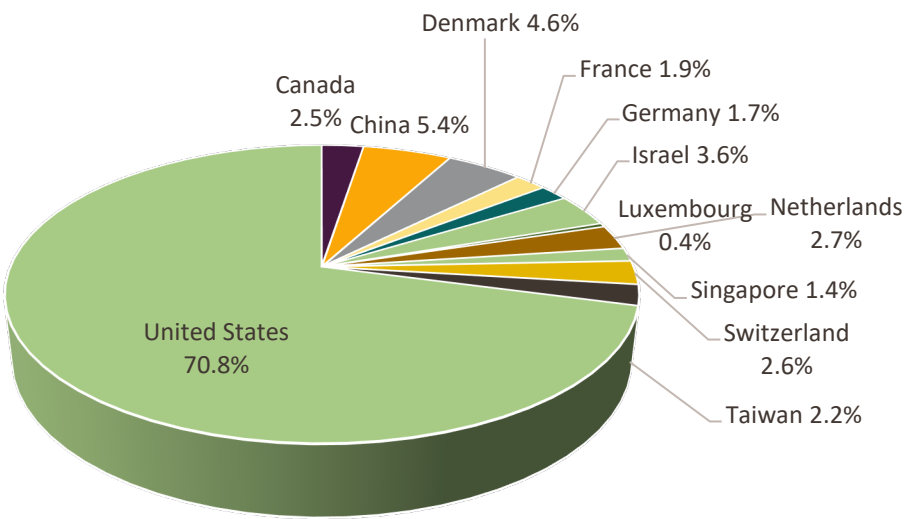
Economic Sectors



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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- SIERRA CLUB, the Sierra Club logos, and “Explore, enjoy and protect the planet.” are registered trademarks of the Sierra Club.
- 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.
- Green Alpha portfolios may invest in companies with small and medium market capitalizations, which may have more limited product lines, markets, and financial resources than larger companies. In addition, their securities may trade less frequently and in more limited volume than those of larger companies. Small or mid-cap stocks may be more volatile than those of larger companies and, where trading volume is thin, the ability to dispose of such securities may be more limited. Green Alpha portfolios may also invest in foreign domiciled companies. Investing in foreign securities may involve additional risks, including exchange-rate fluctuations, limited liquidity, high levels of volatility, social and political instability, and reduced regulation. Emerging markets are often more volatile than developed markets and investing in emerging markets involves greater risks. International investing may not be suitable for everyone. An investment in Green Alpha portfolios should be considered a long-term investment.
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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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