

# Next Economy Index

December 31, 2023

## Green Alpha<sup>®</sup>

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

### Investment Philosophy

Today's economy derives its most significant growth from innovative, high-performing businesses that actively develop and expedite solutions addressing critical systemic issues such as the climate crisis, resource degradation, inequality, and diseases. These companies represent the most promising investment opportunities for both safeguarding and increasing our clients' capital.

Green Alpha adheres to a straightforward philosophy: we actively seek out companies pioneering swiftly scalable and rapidly adaptable, economically competitive solutions.

Our investments seek to de-risk the global economy (which in turn reduces clients' long-term investment risks) by focusing on sectors and industries growing faster than underlying GDP.



### Why Invest in the Next Economy Index?

- Active research and stock selection, passively managed through an annual rebalance
- All-cap means it captures smaller companies accelerating momentum in a massive market transition, in addition to large, proven firms
- ~150 global, market-leading companies developing solutions to core economic and environmental risks

**Inception Date:** December 31, 2008

**Vehicle:** Separately Managed Accounts

### Research

Across portfolios, we aim to identify companies meeting the following criteria:

- They offer products and/or services that mitigate the risk profile of the global economy by providing solutions to pressing economic and environmental challenges.
- Companies allocating a significant portion of revenue to R&D, CapEx, and possessing more IP than their peers.
- Those led by shareholder-aligned, effective, and diverse executive teams and BODs with a record of increasing revenues and expanding profit margins, which in turn drives earnings growth.
- Companies with prudent capital allocation priorities and strong balance sheets.
- Those with shares trading at attractive valuations relative to proven and anticipated growth prospects.

### Portfolio Construction

The Next Economy Index utilizes active research and stock selection, and passive portfolio construction to reflect the Next Economy: the innovation-driven, highly efficient, solutions-oriented sustainable economy that is rapidly displacing the legacy economy.

All companies passing our top-down and bottom-up research processes with sufficiently high proprietary scores are included in the portfolio. All other Green Alpha portfolios are subsets of companies held in the Next Economy Index.

# Largest Positions

How the Next Economy Index is driving progress toward the Next Economy

## **Broadcom** (Sector: Technology, Industry: Semiconductors)

- Broadcom is a global semiconductor leader providing a diverse product portfolio including wireless chips enabling 5G communications, as well as data center, networking, and storage connectivity solutions powering enterprise data infrastructure.
- They pursue an aggressive acquisition strategy that continues to expand market share – it most recently acquired VMware, which offers cloud computing software expansion. In cementing their software pivot, Broadcom could expand its total addressable market by over 50% in cloud data center solutions.
- Leveraging their hardware franchises to expand into software, against a backdrop of strong industry tailwinds, makes the firm attractive at current valuations, in Green Alpha's opinion.
- Importantly, they have advanced productivity of the economy via their extensive range of innovations in semiconductors. In addition to those solutions named above, they have played a significant role in developing and providing components for Wi-Fi devices, which has a widespread impact on daily technology use. Broadcom's advancements have been integral in shaping the technology landscape, especially in areas related to connectivity and data transmission.

## **CrowdStrike Holdings** (Sector: Technology, Industry: Software)

- CrowdStrike is a leading cybersecurity company known for its cloud-native endpoint security platform. They provide comprehensive protection against cyber threats, including malware, ransomware, and nation-state attacks.
- CrowdStrike's Falcon platform utilizes advanced techniques like artificial intelligence and behavioral analytics to detect and prevent breaches. It's particularly renowned for its ability to process vast amounts of data in real-time, enabling rapid threat detection and response. The company serves a wide range of clients from various sectors, emphasizing scalable solutions that cater to complex security needs in an increasingly interconnected digital landscape.
- As traditional firewall security proves insufficient against elevated and sophisticated cyberattacks, CrowdStrike is well-positioned as the frontrunner in next-generation cloud-native endpoint security.

## **Qualcomm** (Sector: Technology, Industry: Semiconductors)

- Qualcomm is a multinational semiconductor and telecommunications equipment company based in San Diego. Founded in 1985, they have grown into a global leader.
- They develop and license key wireless technologies like CDMA and OFDMA mobile communications. The company designs and sells integrated circuits (chips) and software for mobile devices and wireless network equipment. Major products include Snapdragon mobile processors and 5G modem chips.
- Qualcomm has a large patent portfolio covering an array of digital communications technologies. They generate revenue by licensing intellectual property and patents to mobile device makers and supplying equipment manufacturers with chips and software.

**Qualcomm, Zscaler, and Regeneron Pharmaceuticals'** Next Economy attributes are continued on the following page.

| Company Name               | Ticker | Weight        |
|----------------------------|--------|---------------|
| Broadcom                   | AVGO   | 1.41%         |
| CrowdStrike Hldgs          | CRWD   | 1.29%         |
| Qualcomm                   | QCOM   | 1.28%         |
| Zscaler                    | ZS     | 1.12%         |
| Regeneron Pharma           | REGN   | 1.11%         |
| Micron Technology          | MU     | 1.08%         |
| Deutsche Telekom           | DTEGY  | 1.07%         |
| Taiwan Semiconductor Manuf | TSM    | 1.05%         |
| UiPath                     | PATH   | 1.04%         |
| IBM                        | IBM    | 1.03%         |
| <b>% of Portfolio</b>      |        | <b>11.48%</b> |

# Largest Positions *continued*

## **Qualcomm** *continued*

- A notable catalyst in Q4 2023 from Qualcomm's quarterly earnings results and executive commentary was the significant success of their automotive technology business. Q4 automotive chip revenue grew over 60% year-over-year, and the company has an automotive design pipeline of over \$30 billion, signaling massive growth potential. The success of the automotive segment, now the company's third-largest division, underscores a key piece of Qualcomm's diversification into adjacent growth markets beyond mobile and shows tangible traction in auto semiconductors as vehicles trend towards digitalization.
- Qualcomm is a major player enabling 5G connectivity and IoT. They are investing heavily in next-gen technologies like AI, machine learning, and extended reality. Qualcomm continues to innovate and commercialize foundational technologies for the wireless industry.

## **Zscaler** (Sector: Technology, Industry: Software)

- Zscaler is a cloud security company that provides a platform to enable secure digital transformation for enterprises moving to the cloud.
- Their security platform is delivered as a service from the cloud, eliminating the need for traditional on-premise hardware security appliances. This approach supports enterprise mobility, BYOD initiatives, faster user experience across devices, reduced network complexity, and better security vs legacy network models.
- As enterprises accelerate cloud adoption, Zscaler's platform positions it well to disrupt traditional network security architectures and capture growing security spend as companies transition from hardware firewalls to a cloud-based inline traffic inspection model. Its platform boasts major customers like Siemens and Toyota.
- Their flagship services, Zscaler Internet Access and Zscaler Private Access, offer a comprehensive and transformative approach to traditional network security. They operate on a zero-trust model, meaning they verify every connection before granting access, significantly reducing the risk of data breaches and cyber-attacks. This approach allows for secure, direct-to-cloud connections, eliminating the need for traditional VPNs and hardware.

## **Regeneron Pharmaceuticals** (Sector: Health Care, Industry: Biotech & Pharma)

- Regeneron is a leading biotechnology company focused on developing important new medicines for serious diseases. They have brought multiple breakthrough therapies to market, including treatments for eye diseases, allergic and inflammatory diseases, cardiovascular diseases, cancer, pain, infectious diseases and rare diseases. Their most well-known drugs include Eylea for macular degeneration and Dupixent for eczema and asthma.
- They have significantly integrated AI and machine learning (ML) into research and drug discovery processes. The company analyzes decentralized genomic and clinical data, which includes a massive set of data (over 10TB) using Databricks on AWS to improve data processing performance and scalability, allowing them to analyze petabytes of genomic and clinical data quickly. This improved data processing has led to accelerated drug target identification and increased productivity.
- Regeneron does not outsource or contract basic research and drug discovery to others - it directly invests and innovates via its large in-house R&D engine of over 3000 scientists and support staff. This focus leads to impressive productivity. Regeneron's senior management team includes many MDs and PhDs that collaborate closely at the bench with their research staff on advancing new science - a unique structure led by scientist-executives.

# Macroeconomic Commentary

Our complete [2023, 2024, and the Road Ahead](#) review is available [here](#); the summary provided below aims to spark your curiosity to explore the comprehensive content and associated source materials.



In 2023, the dichotomy of our future became starker: a potential utopia or a daunting dystopia. Our path hinges on collective decisions, particularly in financial investments. Money, as a potent agent of change, directs economic growth. Where we choose to invest can either propel innovations that solve critical problems, fostering economic expansion and societal progress, or lead us toward detrimental outcomes. The key lies in aligning our financial resources with sustainable and innovative ventures that promise a brighter, richer, and more abundant, more equitable future. What were 2023's key milestones of hope and despair?

**First: Despair.** Key negative events in 2023 that affected and continue to pose economic and market risks

- **Climate Crisis:** Increased severity of climate events; high investment in fossil fuels both prolonging and causing further environmental damage; subsequent economic risks like insurance companies withdrawing from high-risk areas
- **Geopolitical Conflicts:** Escalation of global conflicts affecting economies and markets; significant wars include Israel-Hamas and Russia-Ukraine
- **American Political Landscape:** Potential impact of the 2024 U.S. Presidential election on environmental policies and global climate action
- **China's Economic Challenges:** China is facing a decline in foreign investments and economic growth due to high debt-to-GDP ratio, affecting global economic dynamics, but also incentivizing China to stabilize relations with the U.S.

## What IS Working?

- **Renewable Energy Growth:** Significant increase in renewable energy adoption and electric vehicle (EV) use; advancements in solar technology and reduction in costs
- **Biotechnological Advances:** Gene editing, particularly CRISPR-Cas9, is showing potentially unlimited promise in medicine and agriculture
- **AI Integration:** AI's growing role in the economy and its impact on productivity and solving major issues
- **Market Conditions:** Improving environment for innovation-driven companies; shifts in investment patterns and potential for growth in sustainable technology sectors; some growth stocks appear undervalued

**2024 Financial Outlook:** Continued expensive money, geopolitical economic reshaping, and rapid technological advancement impacting investment and growth strategies

- The climate crisis is worsening—higher temperatures and more extreme weather are likely
- China taking a more collaborative stance with the West as its economy struggles

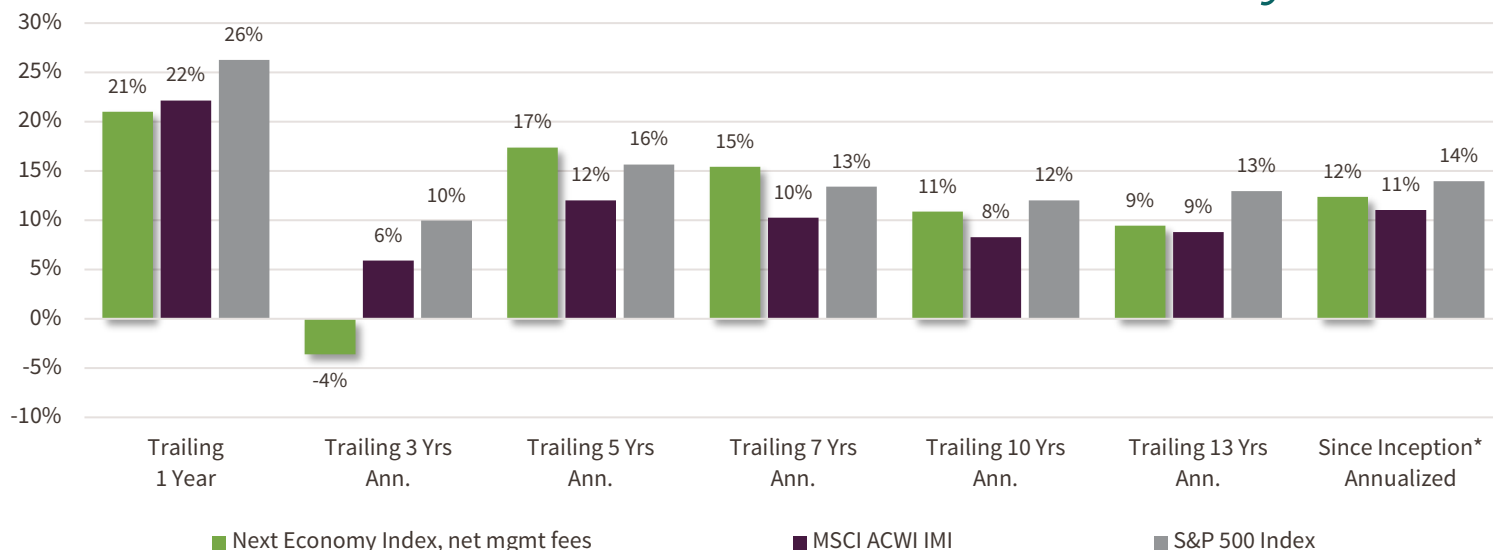
## Key Unknowns

- Whether geopolitical conflicts spread or cool down
- If \$6 trillion in money market funds flows to stocks and other risk assets, that could fuel appreciation in share prices of growth companies

In the context of escalating global challenges, technological innovation emerges as a pivotal force for stability and economic progression. For fiduciaries, it's prudent to direct investment portfolios towards companies demonstrating resilience and innovation in sustainable production functions that can support long-term global growth. These firms are not only transforming their industries, but also show a robust capacity to flourish amid complex global dynamics. A strategic emphasis on such sustainability-focused enterprises highlights the critical role of technology in driving meaningful global change, lowering economic and portfolio risks, and aligning financial returns with positive impact.



# Portfolio Performance & Commentary



For the full year 2023, Green Alpha's Next Economy Index returned 21.00% net of management fees, versus its benchmark, the MSCI All Country World Investable Market Index (MSCI ACWI IMI), which returned 22.15%.

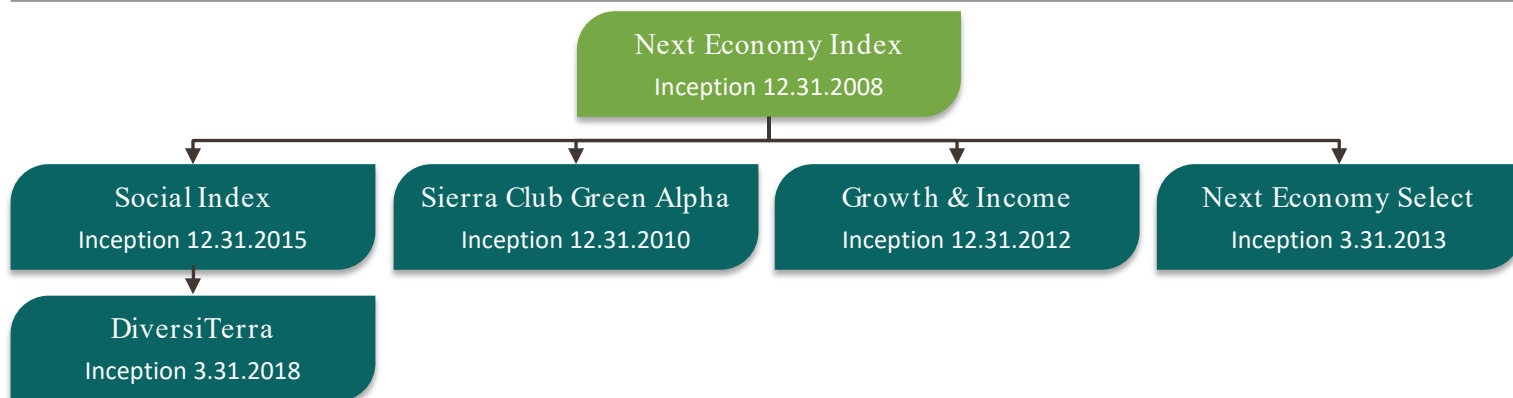
The sectors detracting the most from the strategy's returns were Energy and Utilities.

- Energy was by a wide margin the most significant detractor to our portfolios for the year. Within the Energy sector, solar was the most significant negative contributor due to headwinds affecting the industry and due to the portfolio's overweighting to that industry. Solar headwinds included the exponential rise in interest rates making solar projects at both the utility and homeowner scales appear less financially attractive, temporary supply chain challenges including disruption and price inflation, and a narrative-driven lowering of market appetite for growth-oriented equities. Despite these dynamics, Green Alpha continues to maintain its significant weighting to solar as it remains one of the world's fastest growing industries, is enjoying cost reductions leading to expanding margins, and continues to advance and the cheapest source of new electricity generation available in most of the world. Wind energy faced similar challenges, although at a less significant level than solar.
- The Utilities sector was the second and only other sector to detract from portfolio returns for the year and it only detracted marginally. Thematically, utilities traditionally do well in higher interest rate environments, so 2023 presents something of an anomaly, although the deduction from returns was not significant enough for a definitive assertion.

The strategy's best performing sectors in 2023 were Technology and Real Estate.

- Technology was the sector contributing the most to returns, with chip designers leading, followed by manufacturers and upstream equipment providers. Thematically, interest in AI tended to favor the designers, although the essential practical work of foundries in making the actual chips was also recognized by markets. Following semiconductors, our exposure to security, education, automation and design, and application software companies were the next most significant areas of contribution. Technology hardware companies also contributed, with the majority in that segment coming from communications and digital storage hardware firms. As a reminder, Green Alpha believes that technology presents a uniquely powerful solution set for addressing the world's top systemic risks, and in fact, tech addresses each of our [four pillars of the Next Economy](#).
- Our exposure to real estate was uniformly positive for the year across subgroups, including data centers, office, specialty, industrial, and infrastructure REITs. While data center REITs performed well throughout the year, the other categories primarily rallied in Q4 as expectations for a plateau in interest rates became the dominant narrative. On a fundamentals level, our REIT companies executed on their business models exceptionally well throughout the year, even when share prices didn't reflect it, as their sustainable, desirable spaces were in high demand and their occupancy rates remained well above industry average. We believe that our careful, selective evaluation process results in a highly curated set of equities with excellent potential for continued appreciation matched with an above-average dividend yield.

*\*Portfolio Inception: December 31, 2008. 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.*



- **Largest Next Economy basket** –the most diversified Green Alpha portfolio by number of stocks; all stocks that pass Green Alpha’s top-down and bottom-up investment processes enter the Index
- **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

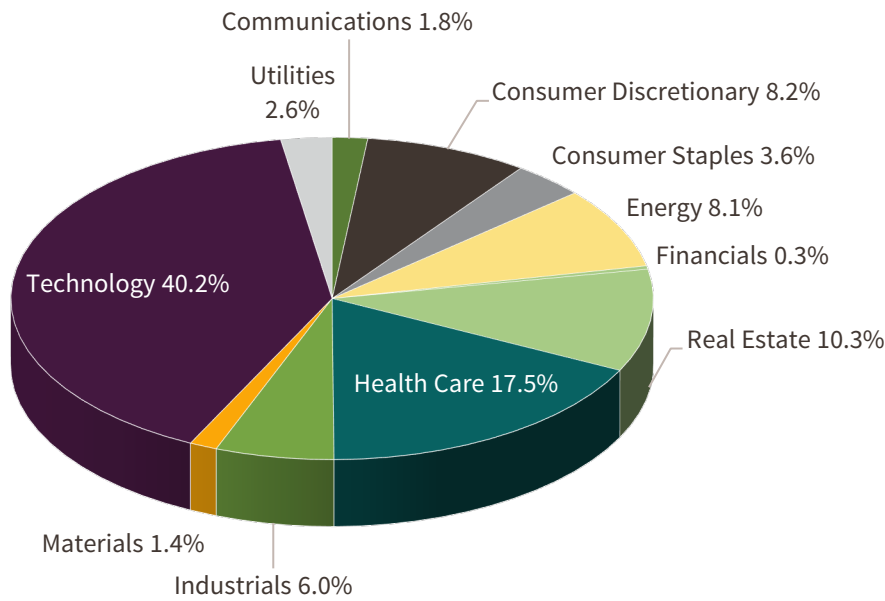
| Characteristics                    | Next Economy Index | Benchmark: MSCI ACWI IMI (SPGM) | Social Index | Next Economy Select | Growth & Income | Sierra Club Green Alpha | DiversiTerra |
|------------------------------------|--------------------|---------------------------------|--------------|---------------------|-----------------|-------------------------|--------------|
| # of Securities                    | 150                | 2,639                           | 114          | 66                  | 36              | 46                      | 58           |
| Active Share vs MSCI ACWI IMI      | 92%                | -                               | 94%          | 96%                 | 97%             | 96%                     | 95%          |
| Active Share vs Next Economy Index | -                  | -                               | 29%          | 63%                 | 71%             | 68%                     | 61%          |
| Sales Growth, Trailing 3-Yr        | 47%                | 15%                             | 63%          | 35%                 | 23%             | 39%                     | 59%          |
| P/E, Current                       | 21.4               | 18.0                            | 25.0         | 16.2                | 15.2            | 14.1                    | 21.0         |
| P/E, 1-Year Forward                | 23.9               | 17.1                            | 27.1         | 18.6                | 15.2            | 16.0                    | 25.4         |
| Price/Sales                        | 2.2                | 1.8                             | 2.3          | 1.6                 | 1.3             | 0.9                     | 2.1          |
| Price/Book                         | 2.8                | 2.6                             | 2.7          | 2.2                 | 1.7             | 1.9                     | 2.4          |
| LT Debt/Equity                     | 58%                | 156%                            | 58%          | 47%                 | 62%             | 60%                     | 56%          |
| Current Ratio                      | 3.9                | 2.3                             | 3.8          | 4.5                 | 3.4             | 3.5                     | 4.2          |
| Dividend Yield                     | 1.17%              | 2.11%                           | 1.02%        | 1.90%               | 3.93%           | 1.97%                   | 1.54%        |
| Market Cap, Wtd Avg (\$B)          | \$94.81            | \$431.37                        | \$82.46      | \$126.13            | \$75.28         | \$124.36                | \$116.58     |
| Market Cap, Median (\$B)           | \$8.26             | \$2.55                          | \$9.69       | \$5.14              | \$28.37         | \$7.41                  | \$5.64       |
| Turnover, Trailing 2-Yr Avg        | 25%                | Not Available                   | 39%          | 12%                 | 16%             | 10%                     | 28%          |
| Beta, Trailing 3-Yrs               | 1.31               | 1.00                            | 1.39         | 1.36                | 1.27            | 1.31                    | 1.32         |
| U.S.-Domiciled Companies           | 78%                | 59%                             | 87%          | 68%                 | 68%             | 72%                     | 81%          |
| % Revenue Derived in U.S.          | 49%                | 44%                             | 57%          | 46%                 | 46%             | 46%                     | 55%          |

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

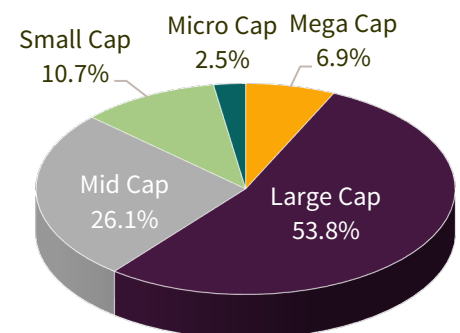
# Portfolio Allocations

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

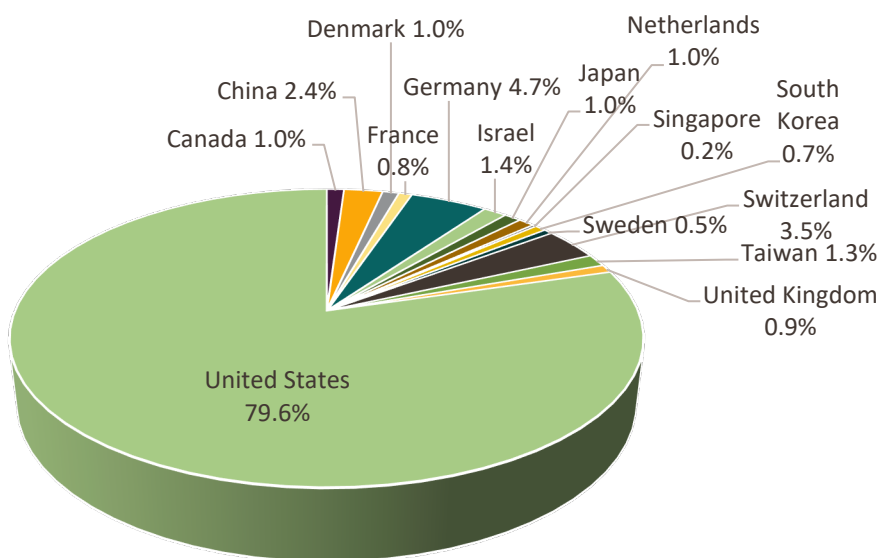
## Sectors



## 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 and is based on a model portfolio. 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.
- Green Alpha Investments is a trade name of Green Alpha Advisors, LLC. Green Alpha is a registered trademark of Green Alpha Advisors, LLC. Green Alpha Advisors also owns the trademarks to “Next Economy,” “Next Economics,” “Next Economy Portfolio Theory,” “Investing in the Next Economy,” and “Investing for the Next Economy.”
- Performance quoted throughout this document represents 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 Next Economy Index 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 \$75,000. The Next Economy Index 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 Next Economy Index 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 Next Economy Index 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, Next Economy Index performance results reflected the actual performance of a representative account, net of actual management fees and transaction costs. Assets managed in the Next Economy Index strategy representative account received a reduced fee from the standard fee schedule. Next Economy Index 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.
- The holdings identified throughout this document do not represent all the securities purchased, sold, or recommended for advisory clients. You may request a list of all recommendations made by Green Alpha in the past year by emailing a request to [info@greenalphaadvisors.com](mailto:info@greenalphaadvisors.com). It should not be assumed that the recommendations made in the past or future were or will be profitable or will equal the performance of the securities cited as examples in this document.
- 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.
- This presentation is for informational purposes only, and should not be construed as legal, tax, investment, or other advice. This presentation does not constitute an offer to sell, or the solicitation of any offer to buy, any security. Any mention of an individual security is for illustrative purposes only and should not be considered a recommendation to buy or sell any security. The presentation does not purport to contain all the information that may be required to evaluate Green Alpha Investments and its investment strategies.