

# Growth & Income

December 31, 2022

## Green Alpha<sup>®</sup>

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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 Growth & Income?

- Active research, stock selection, and portfolio management
- Lower volatility portfolio producing above-market dividend income, while seeking long-term capital preservation and growth
- 25-45 global, market-leading companies developing solutions to core economic and environmental risks

**Inception Date:** December 31, 2012

**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

The Growth & Income portfolio is designed to harness the powerful combination of growth and current income within one portfolio. Portfolio holdings are selected for current or potential dividend yield, coupled with strong revenue growth, bought at a reasonable price.

The Growth & Income strategy typically exhibits lower short-term volatility than broad market indices and other Green Alpha portfolios, while providing a competitive dividend yield.

# Largest Positions

How the Growth & Income portfolio is driving progress toward the Next Economy

## **Horizon Technology Finance** (Sector: Financials, Industry: Specialty Finance)

- Horizon provides structured debt to innovative companies, primarily in life sciences, healthcare information services, sustainability, and cleantech. Horizon has deployed more than \$5 billion in venture loans, including their ~\$635 million book, to more than 285 businesses in the underserved venture loan space.
- The loan portfolio is conservatively managed with transactions usually well below their maximum of \$35 million and terms of 3-5 years backed by security of offering debt on a “first lien” or “first lien behind a bank revolver” basis. They often partner with other institutions to reduce transactional risk.
- In Q3 2022, Horizon’s portfolio grew 40% year-over-year to a record \$635 million, and the company now has a record \$309 million committed backlog. The company’s conservatively managed debt portfolio provides a portfolio level yield of 15.9%, allowing them to pay a current 11.3% equity level dividend yield.
- Technology, sustainability, life sciences, and healthcare technology companies are attracting record investments on the VC side. This means Horizon enjoys a growing total addressable market in an underserved debt arena, and offers the opportunity to invest in a venture loan fund that constitutes a diversified basket of privately-held Next Economy™ companies via a single stock.

## **IBM** (Sector: Technology, Industry: Software & Tech Services)

- IBM is a world leader in driving innovation to mitigate global risks. Having divested from its legacy managed-infrastructure business, IBM has re-emerged as a Next Economy™ powerhouse. Their primary initiatives include blockchain code and technology, cloud computing, AI and machine learning, and quantum computing. IBM has said these innovations “can exponentially alter the speed and scale at which we can uncover solutions to complex problems. We’ve come to call this accelerated discovery.”
- After filing the most U.S. patents annually for 29 straight years, in 2022 IBM pivoted to create more open-source code and platforms, and so was awarded the 2nd largest number of U.S. patents after Samsung. We view this as positive to IBM’s ability to scale as the data economy evolves. They remain among the largest IP holders across many domains: cloud and cognitive software; quantum computing; enabling distributed ledger; pioneering AI; developing security methods atop lattice cryptography; and advancing nanotechnology.
- Women comprise 33%+ of IBM’s workforce. Women with significant authority include the COO, General Counsel, and CHRO. IBM is a longstanding leader on pay equity for both women and minority populations.

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

- TSM is by far the largest semiconductor foundry in the world with 54% market share overall and 85%+ market share of the world’s most advanced chips. It is one of two companies capable of producing advanced 3-nanometer chips, and ahead on the next generation as it prepares to produce 2-nanometer chips in 2023. The company relies solely on internally-generated funds to finance organic growth, capacity expansion, and R&D; never executing buybacks.
- The company features strong fundamentals, with a fortress-like balance sheet and the industry’s highest credit ratings.
- Their new Arizona plant will make advanced 3-and-5-nanometer transistors. A relentless competitor, TSM aggressively invests to grow capacity and innovate, resulting in a nearly insurmountable lead in advanced semi manufacturing.

**Vestas Wind Systems** and **Brookfield Renewable**’s Next Economy attributes are described on the following page.

Company Name	Ticker	Weight
Horizon Tech. Finance	HRZN	7.22%
IBM	IBM	6.56%
Taiwan Semiconductor	TSM	4.84%
Vestas Wind Systems	VWDRY	4.61%
Brookfield Renewable	BEPC	4.37%
<b>% of Portfolio</b>		<b>27.60%</b>

# Largest Positions *continued*

## **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 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.

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

- Brookfield is a leading zero-carbon, 100% renewables-based energy utility. They own ~23.6 GW of electricity production capacity with a pipeline of ~102 GW, making them one of the world's largest pure-play public renewable companies.
- 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.
- Brookfield recently announced the investment of \$2 billion in Scout Clean Energy and Standard Solar to expand their portfolio. So far, Brookfield has invested or allocated \$3.5 billion for clean energy investments and follow-on capital in North America in 2022.
- Women comprise 33% of board directors (including the Audit Committee Chair), 25% of overall workforce, and 25% of the exec team. The exec team has a robustly above-average age spread of 48 years, as does the board at 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.

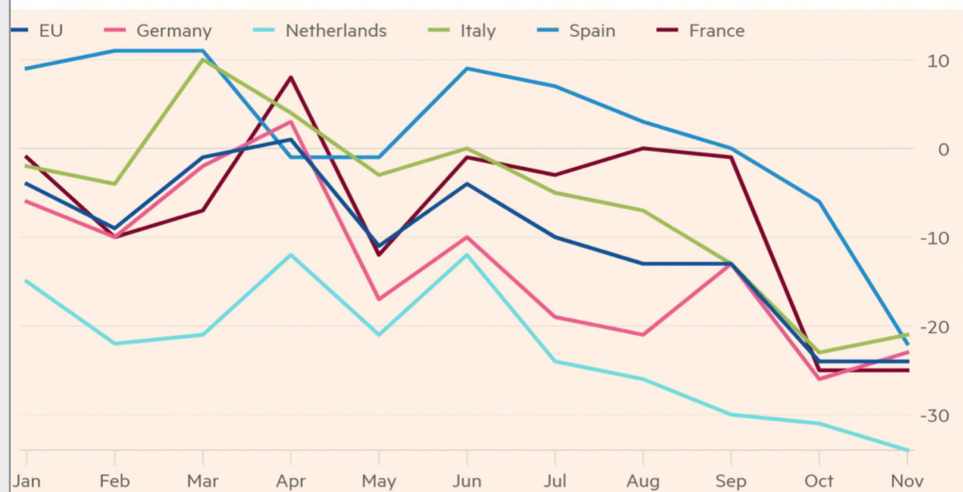
In genomics, 2022 saw [dramatic evidence](#) that one-time therapeutics can treat some types of cancer, a vaccine to prevent malaria became available (and is [already in use](#)), and universal flu and RSV vaccines were developed. 2023 promises more next-gen vaccines.

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.

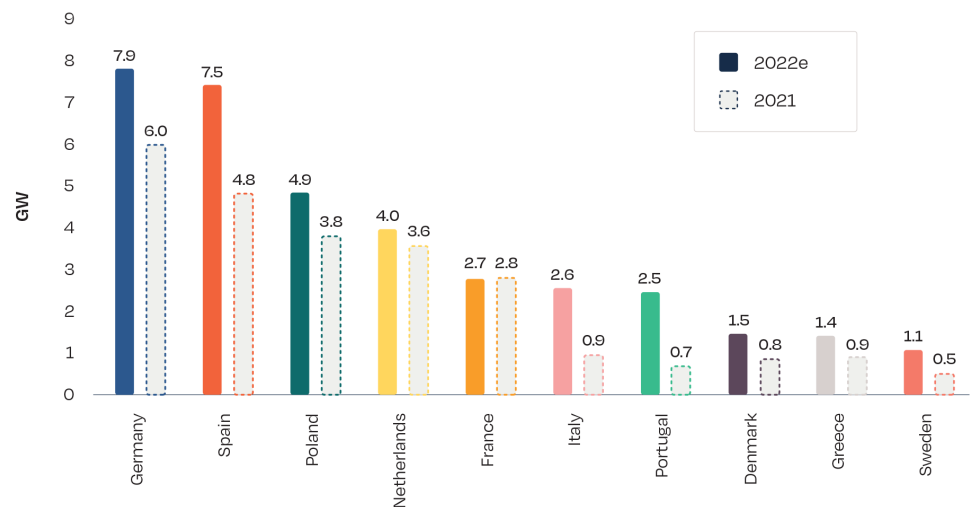
## Green Alpha Investments in 2022

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*

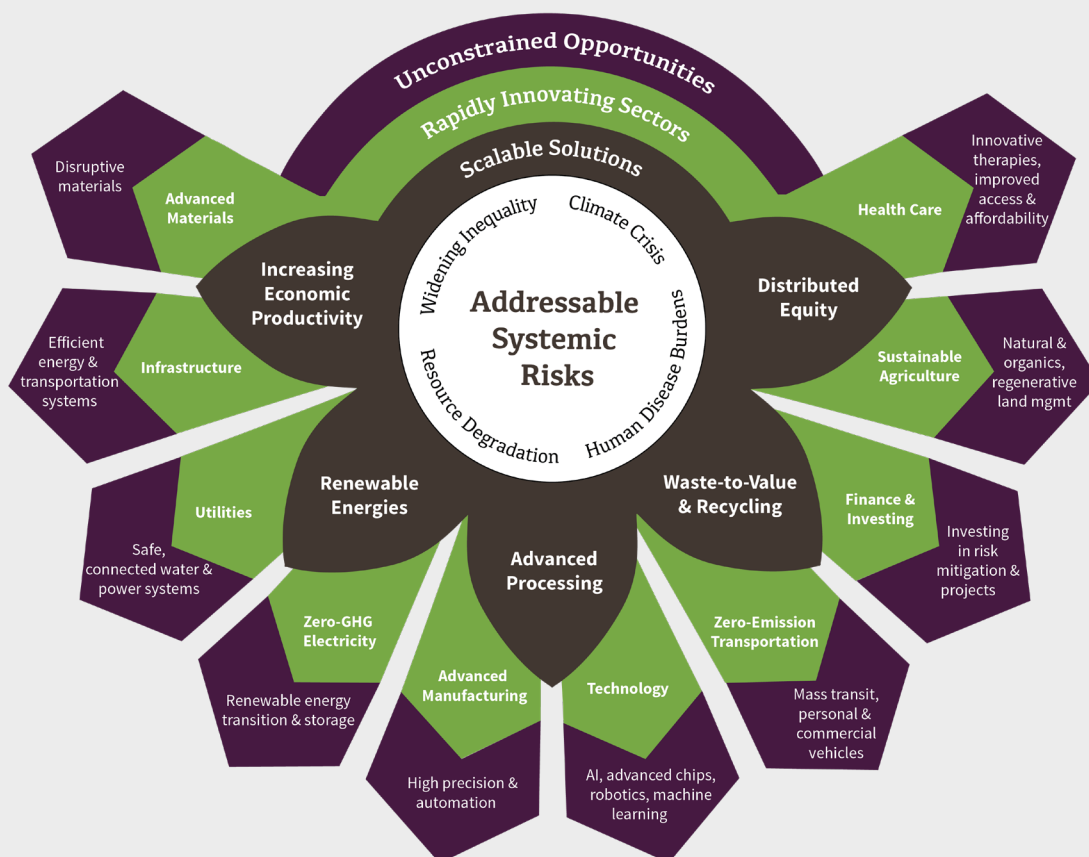
is in many ways still failing to affect sustainability transitions rapidly enough to prevent irreversible, deleterious outcomes. Within those dynamics, we look for opportunities to invest for long-term growth and maximum impact.

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.

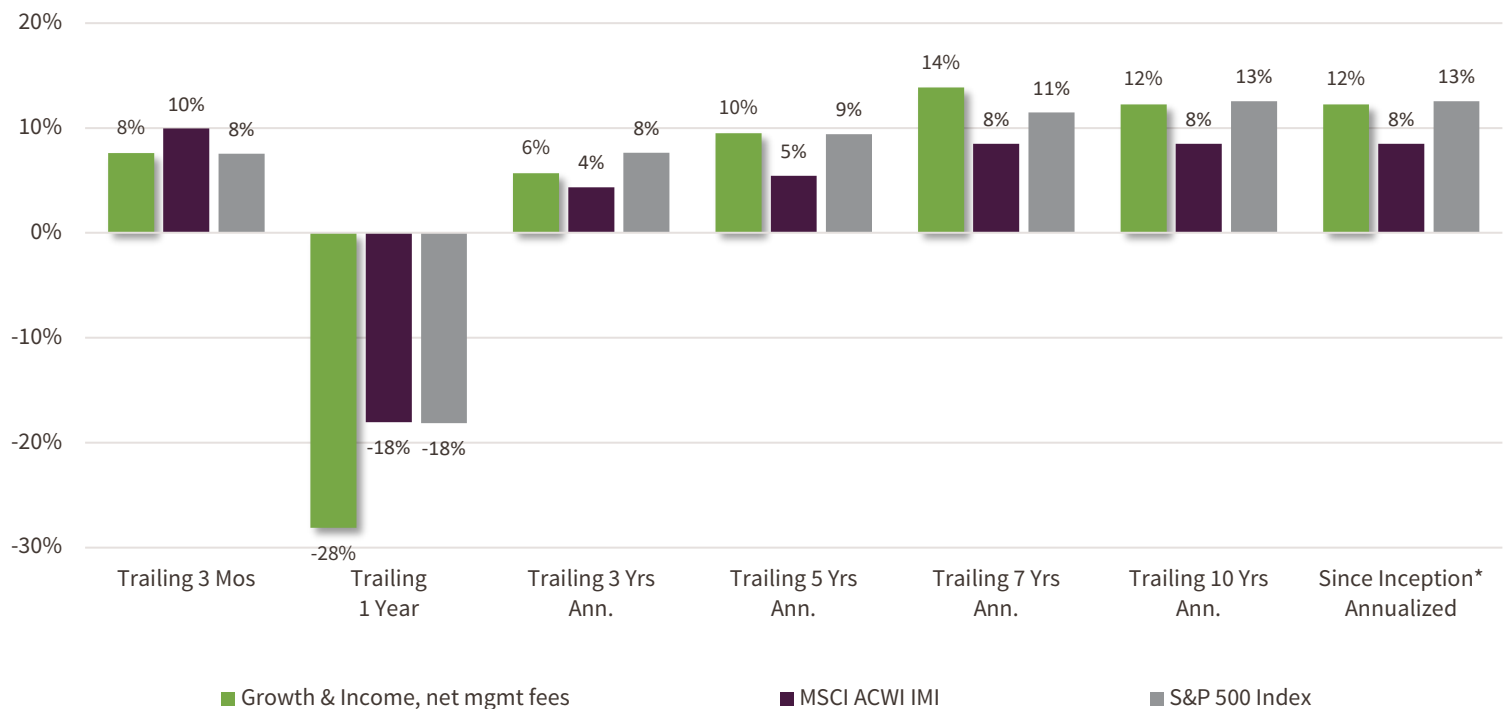
## Green Alpha’s Investment Philosophy in Action

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, Green Alpha's Growth & Income portfolio returned -28.1% 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 diminishing the strategy's returns the most were Real Estate and Technology.

- The Real Estate sector in general, and REITs in particular, traded lower in 2022 in the face of rising interest rates. Within the Growth & Income portfolio, REITs were responsible for a plurality of losses, the greatest of which were from the office REIT subsector, because of overall market sentiment against office space real estate despite the high occupancy rates and long-term leases that exist on Green Alpha's stock picks. Specialty REITs, data center REITs, and infrastructure REITs all declined more modestly.
- Within Technology, losses came entirely from the technology hardware and semiconductors industries. Investments include makers of communications equipment and consumer electronics manufacturing. Losses were partially offset by gains in the information technology services industry.

The strategy's best performing sectors also saw declines in 2022: Energy and Consumer Staples.

- Energy in the strategy was flat for the year. This was entirely the result of the world's largest and most advanced wind turbine maker ending essentially unchanged after a volatile year.
- Within consumer staples, a leading maker of natural and organic foods and beverages as well as a leading chain of natural and organic food stores declined slightly in the rising interest rate environment.

*\*Portfolio Inception: December 31, 2012. 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.*

# Growth & Income

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

## Characteristics

- **High Income** – a compelling combination of robust growth and dividend income that is higher than the broad equity market
- **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	Growth & Income	Benchmark: MSCI ACWI IMI (SPGM)	Next Economy Index	Social Index	Next Economy Select	Sierra Club Green Alpha	DiversiTerra
# of Securities	35	2,488	142	100	62	47	57
Active Share	97%	-	94%	95%	97%	97%	96%
Sales Growth, Trailing 3-Yr	23%	10%	36%	30%	43%	44%	43%
P/E, Current	14.8	14.2	16.1	17.5	15.3	18.8	18.1
P/E, 1-Year Forward	15.3	13.8	16.5	19.0	14.2	17.7	18.6
Price/Sales	1.6	1.7	2.0	2.0	1.7	1.3	1.9
Price/Book	1.7	2.3	2.7	2.6	2.1	2.3	2.7
LT Debt/Equity	59%	169%	120%	101%	71%	70%	124%
Current Ratio	2.9	2.4	3.4	3.8	4.5	2.8	3.2
Dividend Yield	4.59%	2.37%	1.31%	1.20%	2.07%	1.61%	1.50%
Market Cap., Wtd Avg (\$B)	\$66.85	\$261.38	\$60.81	\$59.18	\$75.53	\$73.44	\$78.74
Market Cap., Median (\$B)	\$29.07	\$2.06	\$8.34	\$8.56	\$4.59	\$9.96	\$5.68
Turnover, Trailing 2-Yr Avg	19%	Not Available	32%	39%	17%	20%	31%
Beta, Trailing 2-Yrs	1.16	1.00	1.15	1.21	1.11	1.12	1.15
U.S.-Domiciled Companies	70%	57%	76%	85%	68%	69%	81%
% Revenue Derived in U.S.	48%	43%	49%	55%	47%	47%	58%

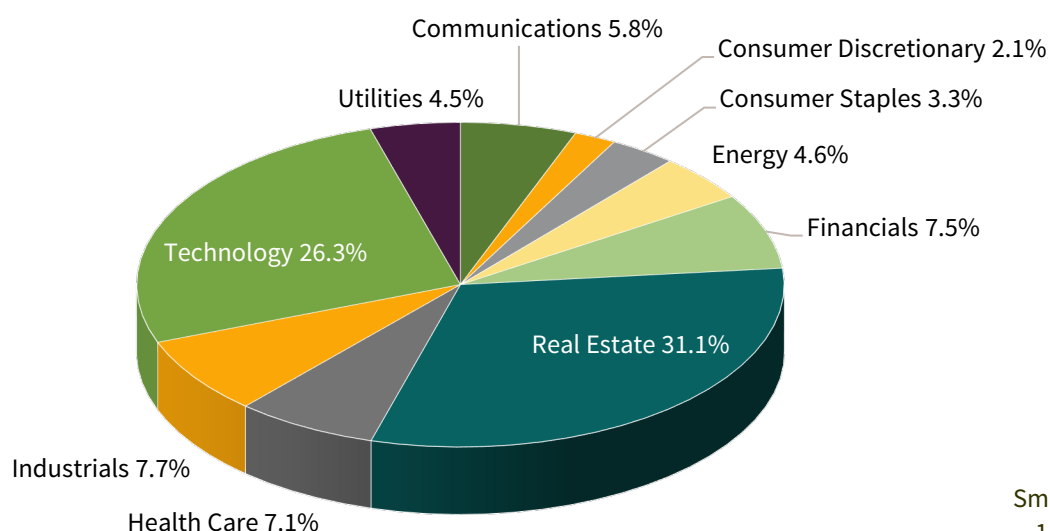
All characteristics are sourced from FactSet, are based on a representative account and include cash. Please see the final page of this document for additional important disclosures.



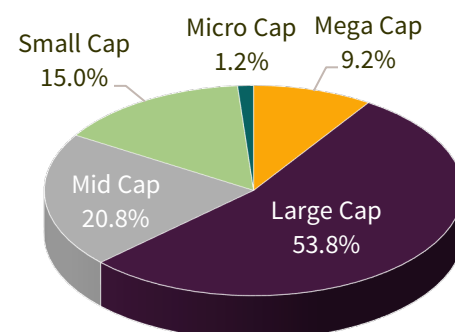
# Portfolio Allocations

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

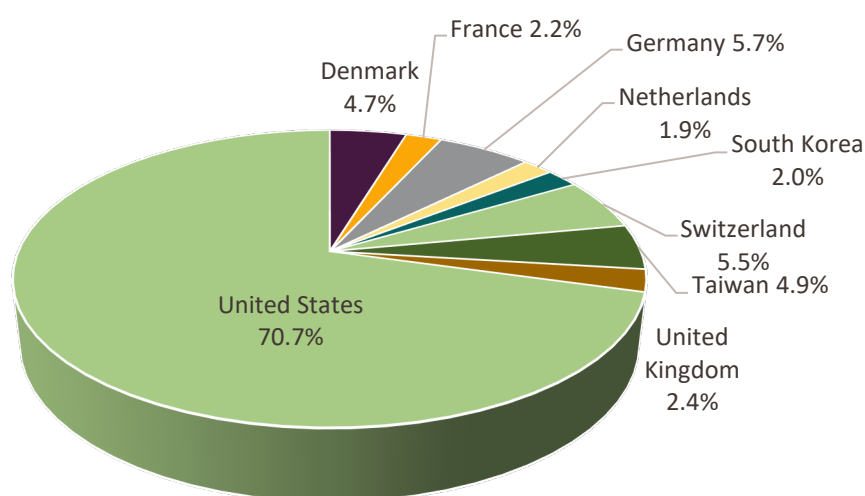
## Economic Sectors



## 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, 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

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- 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 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 July 31, 2021, the Growth & Income performance results are a composite of discretionary client accounts invested in the Growth & Income 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 Growth & Income composite performance results reflect actual performance for a composite of discretionary client accounts. Net-of-fee returns reflect the deduction of actual management fees and transaction costs. Some assets managed in the Growth & Income strategy within the composite receive a reduced fee from the standard management fee schedule. Actual client returns experienced will vary from the returns presented 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. Growth & Income composite performance results do not reflect the reinvestment of dividends and interest.
- Prior to July 31, 2021, the performance results represent a single account managed to the strategy. The performance results shown are not materially higher than if all related accounts were included prior to August 2021. Please contact Green Alpha for information about the representative account selection process.
- 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/>.
- The Growth & Income strategy contains equity stocks that are managed with a view towards capital appreciation and current income. Extreme periods of underperformance or outperformance are due to the concentrated nature of the strategy and the impact of specific security selection. Such results may not be repeatable.
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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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