

# Growth & Income

December 31, 2021

## Green Alpha<sup>®</sup>

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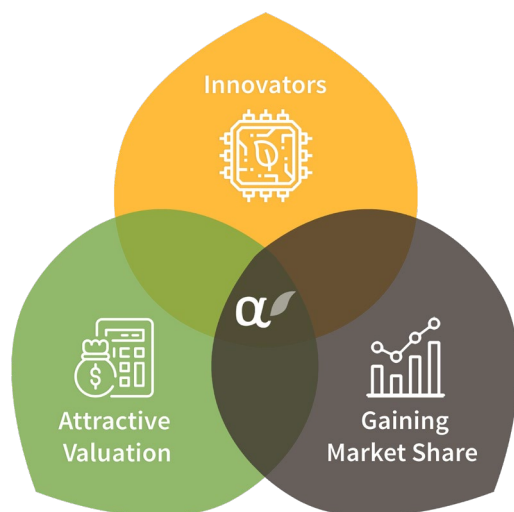
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### Investment Philosophy

We understand that high-functioning, innovative companies creating and accelerating solutions to system-level risks like the climate crisis, resource degradation, worsening inequality, and the human disease burden are the greatest growth drivers of the twenty-first century.

Green Alpha's investment philosophy is straightforward: don't invest in companies that cause global systemic risks; do seek out those creating smart, scalable and rapidly evolving, economically-competitive solutions.

We expect Next Economy™ companies to gain market share, which makes investing in them our best chance at preserving and growing our clients' purchasing power.



### Why Invest in Growth & Income?

- Active research, stock selection, and portfolio mgmt
- Low volatility portfolio producing above-market dividend income, while seeking long-term capital preservation and growth
- 25-35 global, market-leading companies developing solutions to core economic and environmental risks
- Fossil fuel free since inception

**Inception Date:** October 31, 2012

**Style:** All-Cap Global Equities

**Vehicle:** Separately Managed Accounts

### Portfolio Construction

The Growth & Income portfolio is designed to harness the powerful combination of growth and current income within one portfolio. We seek investments in 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 consistent track records of increasing revenues and expanding margins, leading to earnings growth and potential dividend increases
- that trade at compelling valuations relative to proven and anticipated growth, within acceptable levels of risk

Growth & Income portfolio holdings are then selected for current or potential dividend yield, coupled with strong revenue growth, bought at a reasonable price. The strategy typically exhibits lower short-term volatility than other Green Alpha portfolios and broad equity markets, while providing a competitive dividend yield. Our investments seek to de-risk the global economy, which in turn reduces clients' long-term investment risks.

# Growth & Income

How the portfolio compares to the MSCI All Country World Investible Market Index (MSCI ACWI IMI) and other Green Alpha portfolios

## 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:** largest asset class; largest opportunity for impact

Characteristics	Green Alpha Growth & Income	Benchmark: MSCI ACWI IMI (SPGM)	Green Alpha Next Economy Index	Green Alpha Next Economy Social Index	Green Alpha Next Economy Select	Sierra Club Green Alpha
# of Securities	35	1,810	140	89	59	45
Active Share	98%	-	93%	95%	96%	97%
Sales Growth, Trailing 1-Yr	190%	55%	260%	95%	280%	445%
P/E, Current	20.46	19.07	27.08	30.58	22.97	28.27
P/E, 1-Year Forward <sup>†</sup>	20.72	17.14	23.50	27.02	21.37	24.21
Price/Sales	2.34	2.04	3.17	2.98	2.12	2.02
Price/Book	2.47	2.89	4.42	4.62	3.05	3.72
LT Debt/Equity	0.98	0.86	0.84	0.92	0.81	0.85
Current Ratio	1.88	1.96	3.07	2.71	3.80	2.56
Dividend Yield	2.89%	2.19%	1.63%	1.72%	2.15%	1.85%
Market Capitalization, Weighted Avg (US\$B)	\$78.92	\$412.68	\$122.13	\$120.31	\$146.71	\$132.91
Market Capitalization, Median (US\$B)	\$30.92	Not Available	\$12.61	\$13.31	\$8.80	\$15.54
Turnover, Trailing 2-Yr Avg Annual	28%	-	22%	25%	7%	20%
Beta, Trailing 2-Yrs	1.09	1.03	1.03	1.02	1.12	1.13

<sup>†</sup> Bloomberg consensus estimates. Please see the final page of this document for important disclosures about portfolio, benchmark, and characteristic information.

# Largest Positions

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

Company Name	Ticker	Weight
Horizon Tech. Finance	HRZN	6.61%
IBM	IBM	4.97%
Brookfield Renewable	BEPC	4.52%
Taiwan Semiconductor	TSM	4.38%
Hannon Armstrong Sustainable Finance	HASI	4.19%
<b>% of Portfolio</b>		<b>24.67%</b>

## Horizon Technology Finance (Sector: Financials)

- Horizon provides structured debt to innovative companies, primarily in life sciences, healthcare information services, and cleantech. Horizon has deployed more than \$2 billion in venture loans to more than 250 businesses in the underserved venture loan space. The loan portfolio is conservatively managed with transactions usually well below their max. of \$25 million and terms of 48 months or less 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 risk.
- Technology, Life Sciences, and Healthcare Technology companies are attracting record investments on the VC side, despite or perhaps because of the pandemic. This means HRZN enjoys a growing TAM of opportunities in an underserved debt market.
- Horizon offers investors opportunity to invest in a venture loan fund that essentially constitutes a diversified basket of private, Next Economy™ companies via a single stock. Due to their innovative structure, the company offers an attractive dividend yield.

## IBM (Sector: Technology)

- IBM has re-emerged as a Next Economy™ innovation powerhouse. Their primary initiatives to drive present and future revenues include blockchain code and technology, cloud computing, AI and machine learning, and quantum computing.
- In 2021, IBM divested itself of Kyndryl, formerly IBM’s managed IT services arm. As a result, IBM is now more focused on Next Economy applications, illustrative of their pivot towards innovation, and is the latest in a series of divestments (like selling the PC hardware business in the early 2000s) aimed at that goal.
- IBM is a top patent holder across many domains: cloud and cognitive software; quantum computing; enabling distributed ledger; pioneering AI; developing security methods atop lattice cryptography; advancing nanotechnology; developing and applying Watson AI across industries, including medicine, water, food safety; and the most accurate weather forecasting tech.

## Brookfield Renewable (Sector: Utilities)

- Brookfield is one of the world’s leading zero-carbon, 100% renewables-based energy utilities. Their acquisition of TerraForm Power, as well as organic growth and other M&A activity, has given it 20 GW of renewable electricity generation capacity globally.
- Financially, Brookfield is very conservatively managed, is continually looking for acquisitions at favorable prices, and has revenues largely backed by long-term power purchase agreements with high-quality clients. Their long-term goal is to provide annualized investment returns of 12%-15%, which includes planned annual dividend increases.
- The exec team includes six women (30%), and the board of directors is 20% women, including chair of the Audit Committee.

## Taiwan Semiconductor (Sector: Technology)

- TSM is by far the largest semiconductor foundry in the world with a 54% market share overall, and greater than 85% market share among the most advanced chips. TSM is one of two companies capable of producing advanced 5-nanometer chips and is ahead on the next generation as it prepares to produce its 3-nanometer chips in 2022 via the most advanced foundry technology in the world. TSM’s strategic Arizona plant will make advanced 5-nanometer transistors.
- TSM is a relentless competitor that has aggressively invested earnings in innovation and advanced equipment (such as ASML’s EUV machines) over the last two decades while eschewing less competitive expenditures like share buybacks. The result is a (for now) nearly insurmountable lead in global advanced chip manufacturing.

## Hannon Armstrong (Sector: Real Estate)

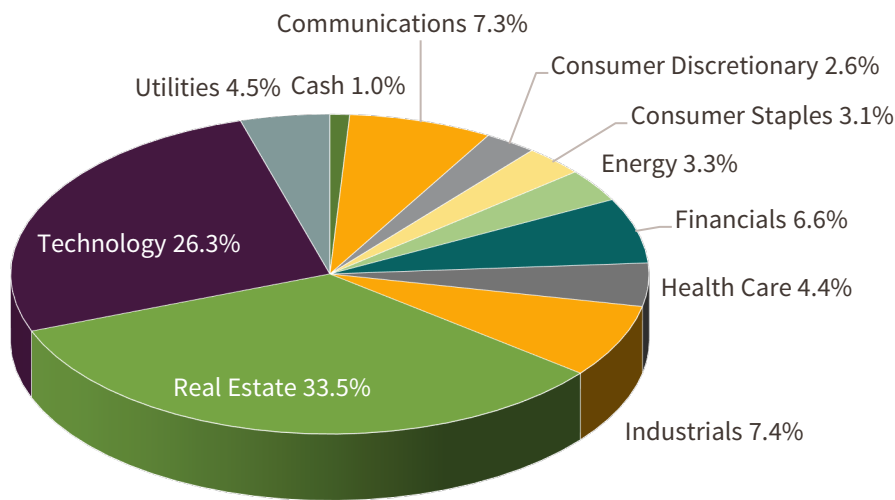
- Hannon Armstrong is a hybrid energy REIT- project investment company earning revenue via its \$7 billion portfolio that includes investments in ventures such as energy-efficient facilities at universities, government and corporate offices, restaurants, and military bases; small-scale, onsite power generation like roof-top solar panels and improving heating and lighting systems; and sustainable infrastructure, such as restoration, conservation, and greywater management.
- The company is a careful manager of capital. Investments undergo a rigorous ROI analysis apart from its sustainability features, and is written as a senior note, meaning among the first in line to be paid if the underlying project or firm encounters turbulence.

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

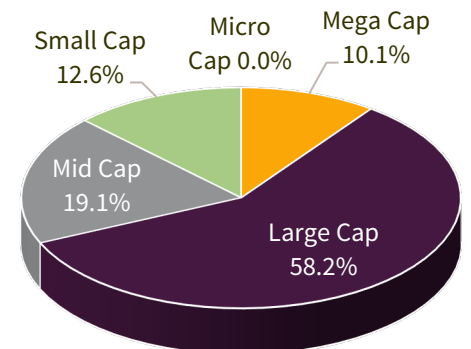
# Portfolio Allocations

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.

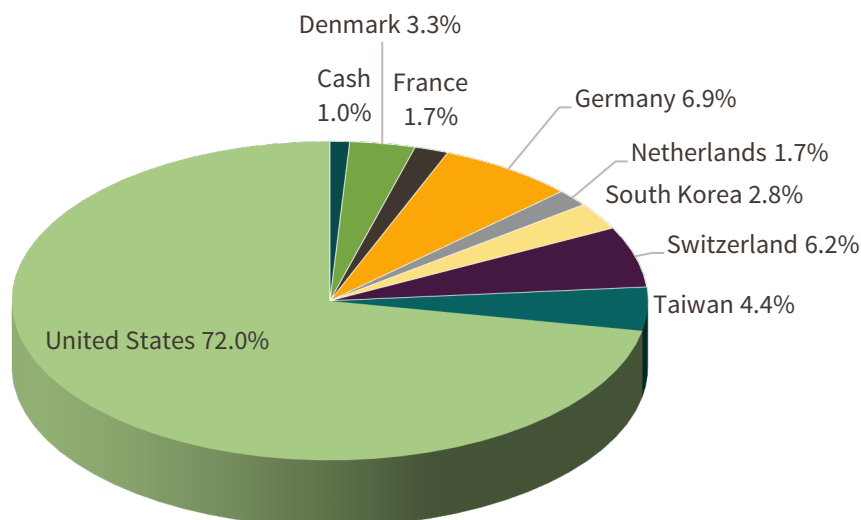
## Economic Sectors ††



## Market Capitalizations



## Companies' Main Headquarters



†† Bloomberg Industry Classification Standard. Please see the final page of this document for important disclosures about portfolio, benchmark, and characteristic information.

# Macroeconomic & Market Commentary

Where investments are made – where capital flows – defines what the economy is. What we purchase and use, how we use it, and how we power it: the whole economy emerges from where investments have gone to provide those things. The economy can become far less or far riskier as a result of our investment decisions, and asset allocators therefore have an outsized role in determining the course of the future.

Tying a bow on 2021, a fast-onset suburban fire in Boulder County, Colorado, Green Alpha's home, that in the span of hours destroyed upwards of 1,000 homes and businesses, was to most of the world one more scrap of data in another year full of climate change-related disasters. For us, it was more personal, causing an evacuation of our office and some employees' homes as smoke blew in and ash fell; we are grateful that the entire Green Alpha team and our families are safe and well. As of this writing, our office is in a location that was under a strict evacuation order. Science has long predicted events like this would become more common and more intense, and that the stability of nature should no longer be taken for granted. Science is doing its part, but investment management has largely ignored scientists' warnings, and; therefore, it remains a weak link in working toward de-risking our collective future. How the asset management industry mounts a response to climate change, via that industry's function of deploying capital, is the proverbial hand on the dial that will in part determine the frequency and severity of more extreme events.

## Our Portfolios in 2021 and Looking Forward

2021 was a year of market underperformance for Green Alpha's strategies (see [Portfolio Snapshots](#) for detailed performance numbers and commentary). As we discuss below, we believe our thesis represents a reliable path forward in terms of preserving and growing our clients' purchasing power, and that it will, over the longer term, prove effective over market cycles of inflation, deflation, stimulative policy, cooling policy, and as economic narratives real and imagined rise and fall. Whether or not you find yourself concerned about our 2021 relative underperformance, read on to learn how we're looking forward.

It starts with the flexibility to source ideas wherever they occur, to be "go anywhere" in the service of finding attractive investments, and then doing the deep work of evaluating a company on its intrinsic merits. Plumbing the complexities of a company's business and how it fits into the context of the world's economic and environmental systems is harder and more complex than is looking uncritically at P/E ratios and ESG ratings. Yet it is work we like to do, because it has become so critical to analyze the actual position of a firm relative to the evolving complexities of the global environment and everything within it, including the economy. If we try to reduce ourselves to algorithmic rules, we eliminate the ability to be flexible in the face of change. In a time of accelerating risks, we can no longer assume simple ratios are telling us all that we need to know about our investments; we need to look deeper.

Companies delivering better business performance often outperform markets in general<sup>i,ii</sup> but investing based on business results requires patience, because news and zeitgeist narratives can drive market valuations more than fundamentals, sometimes for substantial periods of time.

For example, consider solar PV manufacturing. Solar exists in a fast-growing market for electricity, it is in demand because it is a zero-carbon source of electricity that is also cost competitive with any other source of electricity generation, and it can be profitably deployed almost anywhere, even at high latitude nations like Germany. As a result, solar is gaining market share from legacy sources at a rapid rate and it is doing so in a fast-growing TAM. The better-run solar manufacturers are growing revenues, expanding their production capacities, earning operating leverage to expand their

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<sup>i</sup> Joseph D. Piotroski, *Journal of Accounting Research* Vol. 38, Supplement: Studies on Accounting Information and the Economics of the Firm (2000) <https://www.jstor.org/stable/2672906>

<sup>ii</sup> Clifford S. Asness, Andrea Frazzini, and Lasse H. Pedersen, *Quality Minus Junk* (2013) [http://www.econ.yale.edu/~shiller/behfin/2013\\_04-10/asness-frazzini-pedersen.pdf](http://www.econ.yale.edu/~shiller/behfin/2013_04-10/asness-frazzini-pedersen.pdf)

## Commentary *(continued)*

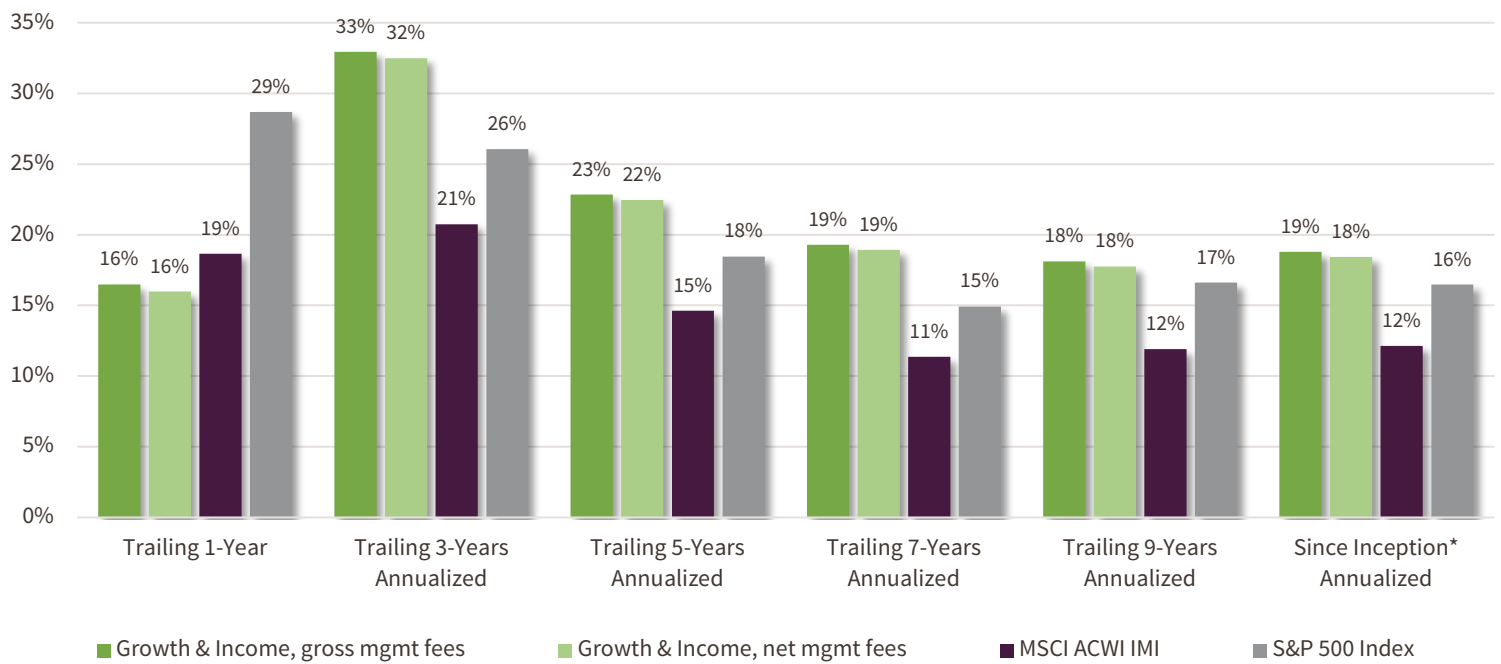
margins, and using their newfound scale and credibility to lower their costs of capital. And yet, market multiples of these companies remain stubbornly low. Why? Partially due to genuine short-term concerns about supply chains and interest rates, but largely because of the common narrative. It is often said that solar is niche, it won't work because it is intermittent, Solyndra was a disaster, solar isn't core energy, it is an alternative. These and similar arguments are still surprisingly common in markets, and even embedded in our systems. For example, solar isn't considered "energy" in MSCI's Global Industry Classification Standard ("GICS"), but rather it is defined as "technology."

But while narratives matter in the short and sometimes medium terms, it is business results and overall fundamentals that drive returns in the long run. Business results-based returns, which come from reinvestment of retained earnings into expansionary pursuits such as growing production capacity, improving production efficiencies, and aggressive spending to drive innovation, are more predictable and enduring than momentum or multiple-expansion-based returns. Companies capable of sustaining stronger-than-average business results over time are more likely to reward investors. Which is why we focus on the Next Economy™. It is our job to find what ideas are most likely to work, become much larger and more profitable, and still be effective and valuable in the face of the climate crisis, resource degradation, worsening inequality, and mounting human disease burdens. Among the companies delivering on these ideas, we research which own the most and best intellectual property ("IP") for safely running the global economy, and which best manage their capital for intrinsic growth. Summed into one question, Green Alpha wants to know: Will this business enable us to thrive on the planet without disrupting the systems on which we rely? When we identify conviction firms, we can find value, tactically, in periods when the narrative turns against Next Economy companies.

This has been, is, and will be our focus. We won't deviate from this thesis when the news narrative turns against one of our conviction sectors, industries, or companies. In 2021, the narrative was negative towards renewable energies, some advanced biotech companies, and disruptive innovation in general. Since we believe that science, research, and innovation are how we are solving – and will continue to solve our biggest challenges – we were often in disagreement with the 2021 zeitgeist. It is abundantly evident today that we live in what author [Azeem Azhar](#) has dubbed the Exponential Age, and neither economists nor asset managers can continue to assume that the economy will continue to slowly progress as an extension of the economy we already know. Rather, Green Alpha can devise new processes and implement systems to follow to make our methodologies as adaptive as possible. For this, we gain valuable insights from the disciplines of predictive modeling and scenario planning: assimilate as much macro and micro information as possible and develop an educated thesis that represents a probable set of outcomes for a given company, industry, sector, and/or the economy as a whole.

Within all of this, one thing is clear to us: future demand – and thus market returns – can expect to be correlated with the structural trend of climate change. As Nicholas Stern has reminded us, "climate change is the biggest market failure the world has ever seen." In the context of [Herbert Stein's](#) Law, "trends that can't continue, won't," we can use this to plot a path forward. By targeting the intersection of the most economically productive yet nondestructive (*and ideally regenerative*) innovations, excellent fundamentals, and careful capital custodianship, we're adding waypoints to that path. Green Alpha is striving to set the standard for what asset management can and should do to realize a regenerative, zero-risk economy, and to earn competitive returns as that economy expands.

*Growth & Income portfolio-specific reflections follow on the next page*



In 2021, Green Alpha's Growth & Income portfolio returned 15.98% net of management fees vs its benchmark, the MSCI All Country World Investible Market Index (MSCI ACWI IMI), at 18.66%.

The portfolio's top-contributing sectors for the year were Technology and Real Estate.

- Within the Technology sector, gains were led by advanced chip designers and semiconductor manufacturing companies, as they benefited from remote work, learn-from-home, and growth of the Internet of Things, along with increased pricing power from the global semiconductor shortage. Their focus on wireless connectivity, artificial intelligence, and security made devices more intelligent, connected, energy efficient, and secure.
- In the Real Estate sector, returns from data center real estate trusts contributed, as those businesses benefited from the heightening reliance on technology and acceleration in digital transformation strategies by enterprises of all kinds. Along with the fast adoption of e-commerce, logistics real estate outperformed due to raised inventory throughputs. The portfolio's exposure to North America's leading green office REITs also contributed.

The two sectors that detracted the most from the portfolio's returns were Utilities and Energy.

- Overall portfolio underperformance versus the benchmark in 2021 was mostly due to renewable energy declining as a sector, having peaked near inauguration day. The utilities in this portfolio were solely power generation utilities, which for Green Alpha means only those powered by 100% renewables, and they culminated in the sector being the portfolio's second largest detractor. The negative contributions from Energy and Utilities are consequently from the same phenomenon of renewable energies being cyclically out of favor in the markets. The narratives surrounding negative performance in renewable energy were inflation concerns and rising bond yields, which have hurt innovation-themed, "futuristic," and growth stocks; and the second headwind for renewables has been the U.S.' poor policy response to the climate crisis being taken by the markets as a signal that renewables' growth may slow. However, real business results for renewable energies were good in 2021. In the U.S., wind and solar accounted for 85% of new electricity generation capacity additions during the year, showing that renewables are continuing to proliferate and gain market share from legacy forms of energy. Green Alpha believes renewables' current headwinds will dissipate over the longer term, even in the face of negative policy, as business growth and the resulting positive company reports demonstrate the enduring nature of the global energy transition.

*\*Portfolio Inception: October 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 important disclosures about portfolio, benchmark, and characteristic information.*

# 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 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 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 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 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 Advisors, LLC. Growth & Income 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 July 31, 2021, Growth & Income performance results reflect performance of a model portfolio. The Growth & Income model performance does not reflect any transaction costs. Growth & Income model performance results do reflect the reinvestment of dividends and interest. Model performance has inherent limitations. The returns shown during that time period are model results only, and do not represent the results of actual trading of client assets. The model performance shown does not reflect the impact that material economic and market factors had, or might have had, on decision making if the account held actual client capital. Actual client accounts in this strategy are managed by Green Alpha based on the model portfolio, but the actual composition and performance of these accounts may differ from those of the model portfolio due to differences in the timing and prices of trades, and the identity and weightings of securities holdings.
- 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.
- Regardless of time frame, all characteristics data are sourced from Bloomberg Finance L.P. based on a model Growth & Income portfolio that may or may not be exactly what is delivered on each custodial or wrap account platform.
- 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.
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