Next Economy Index

September 30, 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 the Next Economy Index?

- Active research and stock selection
- Passively managed through an annual rebalance
- Demonstrates the diversity, growth, breadth, and depth of the rapidly-developing Next Economy™
- ~144 global, market-leading companies developing solutions to core economic and environmental risks

Inception Date: December 31, 2008

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 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

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 unfolding.

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

Largest Positions

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

Company Name	Ticker	Weight
First Solar	FSLR	1.58%
Enphase Energy	ENPH	1.24%
Wolfspeed	WOLF	1.23%
Tesla	TSLA	1.19%
Beam Therapeutics	BEAM	1.07%
IBM	IBM	1.06%
Rivian Automotive	RIVN	1.03%
Apple	AAPL	1.03%
PayPal Holding	PYPL	1.03%
Array Technologies	ARRY	1.01%
% of Portfolio		**11.47%**

First Solar *(Sector: 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 FSLR has fewer supply chain dependencies than traditional c-Si solar PV makers, and avoids dependencies on China, which dominates the c-Si industry.
- The company plans to grow revenues by investing $1 billion in a new, 3.5 GW module factory in the Southeast, while an additional $185 million will add 1 GW of new manufacturing to the company's facility 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 is 25% female, including the Lead Independent Director and Audit Committee Chair. The Chief People & Communications Officer is also non-male. Importantly, leadership boasts an above-average age spread of 32 years.

Enphase Energy *(Sector: 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 has extended 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 a power outage.
- The company has installed more than 48 million microinverters on over 2.5 million homes in over 140 countries, shipped over 15 GW of DC microinverters and provided over 559.5 MWh of storage.
- Females comprise 25% of Enphase’s leadership team, including the CFO, CMO, and General Counsel.

Wolfspeed *(Sector: Technology)*

- Wolfspeed is a semiconductor company focused on silicon carbide and GaN technologies. These materials are optimal for semiconductor applications like transportation, power inverters, and wireless functions.
- A global leader in silicon carbide as a semiconductor, the company stands to benefit as applications for the tech expand in the addressable markets of renewable energies and electric transportation.
- Recent growth includes building the world’s largest silicon carbide fabrication facility in New York, complementing its North Carolina location. This facility is automotive-qualified and 200mm-capable. 50% of electricity used is from carbon-free or low carbon sources, and 60,000 gallons of water are recycled per day.

***Tesla** and **Beam Therapeutics**’ Next Economy attributes are described on the following page.*

Largest positions *continued*

Tesla *(Sector: Consumer Discretionary)*

- Tesla is a leading innovator of zero-emissions vehicles, energy and power solutions, and advanced AI capabilities. They are growing production for all products and rapidly increasing both revenues and margins. While most auto OEMs reported supply chain-related declines in deliveries, Tesla delivered a record-setting 35% more vehicles in Q3 2022 vs. Q2 2022. They are expanding production capacity via new manufacturing facilities in Austin and Berlin, as well as accelerating production at existing plants. Shanghai alone is expected to reach a run rate of 1M+ vehicles/year by the end of 2022.
- Tesla is striving to be carbon zero and is making progress on waste-to-value in supply chains. They do not landfill any lithium-ion batteries when vehicles reach end-of-life—100% are recycled—and Tesla service centers will accept most consumer electronics for free. Tesla powers much of its global manufacturing with renewable energies (with a 100% goal) and intends to power all 30,000+ Supercharger stations (forming the world's largest charging network) with renewable energy by the end of 2022.

Beam Therapeutics *(Sector: Health Care)*

- Beam Therapeutics is a biotechnology company working in the field of genome editing. Beam uses base editing, an incredibly precise form of gene editing designed to alter a single DNA letter which causes a single strand break as opposed to a double strand break used in other types of genome editing.
- Beam has a robust therapeutics pipeline with 10 in-house programs in research and early clinical development. Beam's pipeline is directed at hematology and oncology, liver disease, and ocular and CNS disease, using different delivery methods for each. The company has research, IP, and distribution agreements with Pfizer and Verve Therapeutics.
- Beam recently presented the first in vivo data demonstrating the potential of their multiplex base editing approach to both reduce viral markers—including hepatitis B surface antigen expression—and prevent viral rebound of hepatitis B virus in in vivo models.
- Females comprise 55% of the leadership team, including the CFO, CMO, Chief Business Officer, Chief Human Resources Officer, Chief Legal Officer, and Chief Accounting Officer. The team also boasts an impressive age spread of 32 years.

Macroeconomic Commentary

The third quarter of 2022 was characterized generally by market declines in major indices, both domestically and globally. In the U.S., the primary reasons for negative market sentiment were the specter of rising (*or at least unabating*) inflation, and the Federal Reserve's aggressive response of large interest rate hikes in an attempt to control it. Interest rates have been the markets' focus for most of the year, but with the Fed signaling in Q3 that it was willing and able to intentionally create a recession if required to tame inflation, markets began to perceive the possibility of a shrinking economy. The Fed moved twice in the quarter, raising the Fed Funds rate a total of 1.5%, the highest since 2008. This significantly increases the cost of capital for all companies; more expensive capital means narrower margins, and the threat of recession raises the potential for less business activity.

The result for markets was a scenario leaving little place to hide. Economywide, all but two sectors (via the Global Industry Classification Standard) finished down, and the two positives, energy (up 0.01%) and consumer discretionary (up 0.36%), each increased anemic amounts. The MSCI All Country World Investable Market Index (MSCI ACWI IMI) had no positive sector returns for the quarter, bonds were down (Bloomberg U.S. Agg Total Return was down 4.75% for the quarter), most commodities declined, and cash was still losing value to inflation.

Geopolitical events continued to unnerve economies as well, and there is no question that we have entered a period of uncertainty with respect to the equity markets. Consequently, careful stock selection and active management are becoming more and more important.

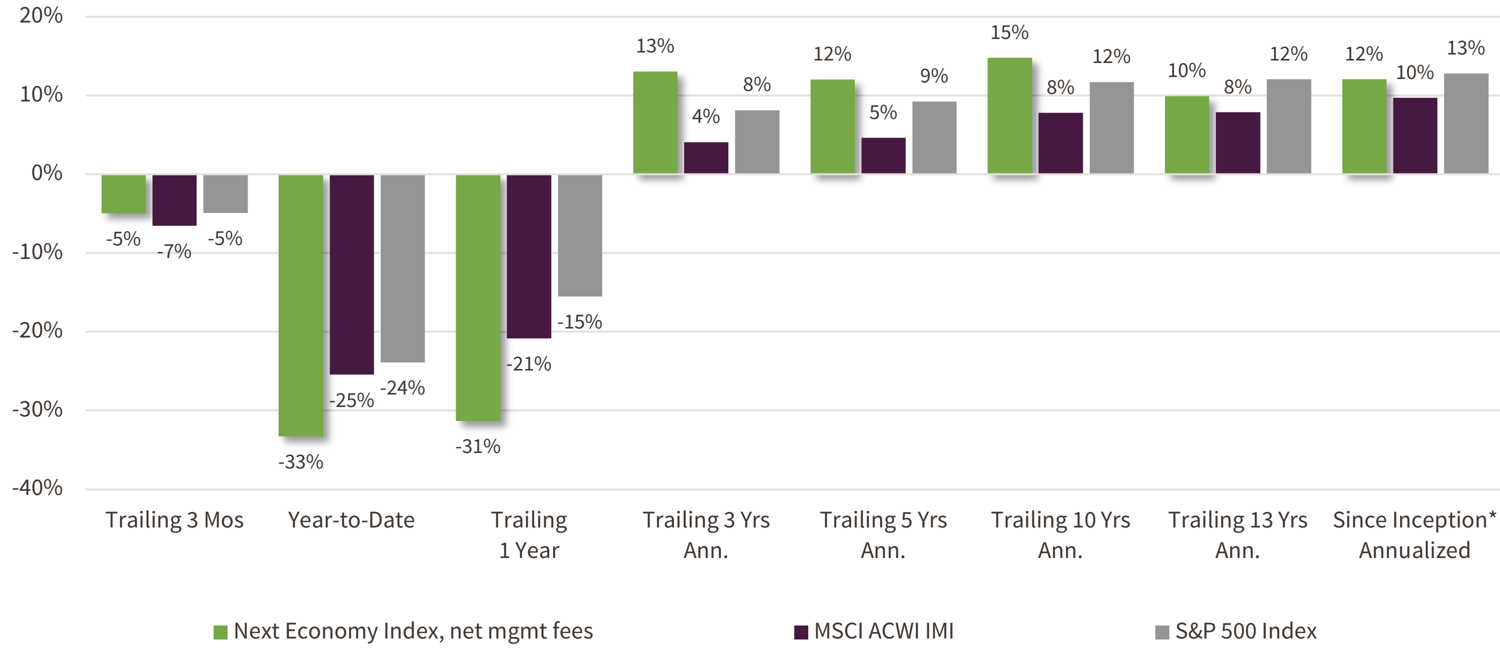
All the above economic factors illustrate the need for careful consideration of every holding in a portfolio: companies with strong balance sheets, earnings, and cash flows will become increasingly important as volatility continues into the immediately foreseeable future. Equally important is the need to understand risk vs. forward opportunity and real growth potential, while grasping the dynamics of market leadership, defensibility of market position—including intellectual property moats, capital allocation priorities, ability to access capital, balance sheet strength, and careful analysis of current valuations vs. expected growth.

These are all key attributes of Green Alpha's research process. For the firm, building portfolios that reflect the sustainable economy is not a matter of using ESG scores to filter an index list. Rather, it is a labor-intensive process of purposely selecting and evaluating each holding in terms of the above factors, as well as the business's net contribution to stabilizing the economy. Green Alpha's approach is to behave like private equity portfolio managers, evaluating each company meticulously as there is no index or benchmark to fall back on.

Amid a tough quarter, July was a bright spot for the Next Economy™ strategies. Each of the portfolios demonstrated meaningful relative and absolute performance, much of which can be attributed to the passage of the Investment Reduction Act (IRA). The IRA will, beginning in 2023, provide significant tax benefits, subsidies, and alternative incentives to renewable energies, zero emissions transportation, and other Next Economy areas of interest. Green Alpha does not consider potential policy tailwinds when making investments, preferring to rely solely on holdings' competitiveness and fundamentals, as well as on market context provided by the macro environment. That said, if policy does provide catalysts for share price appreciation, Green Alpha is happy for its clients to benefit.

Portfolio-specific commentary is on the following page.

Portfolio Performance & Commentary



For the three quarters ending September 30th, Green Alpha's Next Economy Index returned -33.29% net of management fees, versus its benchmark, the MSCI All Country World Investable Market Index (MSCI ACWI IMI), which returned -25.44%.

The sectors detracting the most from the strategy's returns were Technology and Health Care.

- Technology declines were largely precipitated by a rotation to safety as interest rates climbed and recession fears grew. Amongst industries contributing to declines were financial transaction & business software, electronics manufacturing, consumer electronics, computer hardware & storage, telecommunications equipment, semiconductor manufacturing, foundry services, front-end capital equipment, and semiconductor devices.
- Within the Health Care sector, diminishing returns were also triggered by the same turn to safety in response to climbing interest rates and growing recession fears. Most losses came from the biotech & pharma industry as genomic therapeutics and diagnostics companies suffered this quarter. The health care facilities and services industry also declined, although more modestly.

The strategy's best performing sectors were Energy and Financials.

- Within Energy—which for Green Alpha is exclusively the various parts of the renewable energy value chain—stocks enjoyed a large rally in July with the passage of the Inflation Reduction Act (IRA); however, those gains were later moderated with the broad market declines in August and September. The strategy's top performers year-to-date include the world's leading thin-film solar manufacturing company, a key maker of smart solar inverters, and a chief zero-emissions manufacturer of batteries for grid energy storage.
- Within Financials, the current environment of climbing interest rates has caused a broad decline in equities. Green Alpha's exposure to the Financials sector has been spared the worst of this pullback with one venture debt financing firm only declining modestly.

**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.*

Next Economy Index

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

Characteristics

- **Largest Next Economy basket** – by definition, the Index is 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, 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

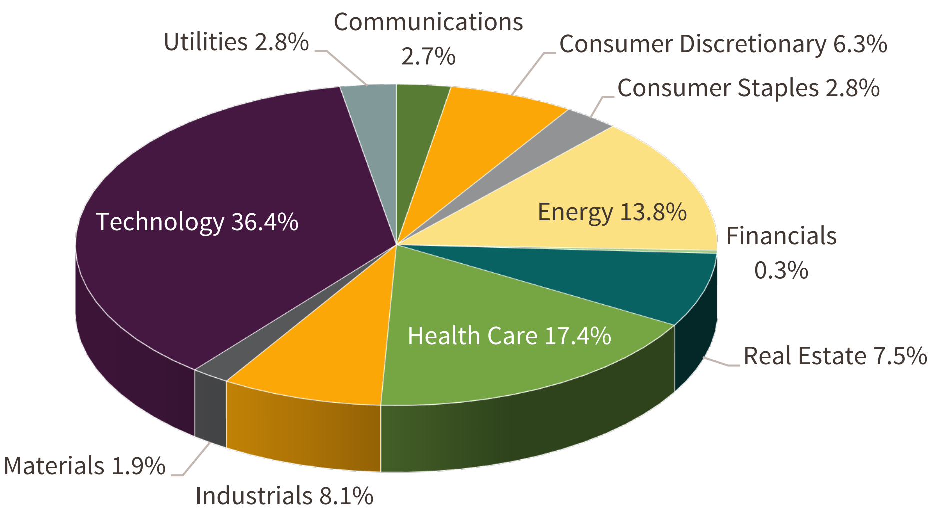
Characteristics	Next Economy Index	Benchmark: MSCI ACWI IMI (SPGM)	Social Index	Next Economy Select	Growth & Income	Sierra Club Green Alpha	DiversiTerra
# of Securities	144	2,502	101	57	36	47	57
Active Share	93%	-	95%	96%	97%	96%	96%
Sales Growth, Trailing 3-Yr	35%	10%	28%	39%	23%	39%	33%
P/E, Current	14.6	13.5	15.5	13.4	12.0	17.0	16.5
P/E, 1-Year Forward	15.6	13.0	15.8	13.5	11.5	18.0	16.0
Price/Sales	2.1	1.6	2.0	1.8	1.4	1.4	2.0
Price/Book	2.7	2.2	2.5	2.3	1.7	2.8	2.8
LT Debt/Equity	121%	461%	108%	55%	91%	70%	133%
Current Ratio	4.1	2.2	3.8	5.7	4.4	3.1	4.1
Dividend Yield	1.28%	2.48%	1.23%	1.89%	5.14%	1.24%	1.42%
Market Cap., Wtd Avg ($B)	$63.96	$289.99	$56.89	$85.48	$55.62	$92.58	$78.62
Market Cap., Median ($B)	$7.97	$1.87	$8.18	$5.08	$26.08	$14.10	$7.17
Turnover, Trailing 2-Yr Avg	24%	-	34%	1%	9%	11%	30%
Beta, Trailing 2-Yrs	1.20	1.00	1.22	1.19	0.96	1.17	1.16
U.S.-Domiciled Companies	78%	59%	86%	70%	71%	70%	83%
% Revenue Derived in U.S.	50%	44%	56%	50%	50%	48%	60%

All characteristics are sourced from FactSet and are based on a representative account, including cash. Beta is the exception, being sourced from Bloomberg while we are converting platforms. Please see the final page of this document for additional important disclosures.

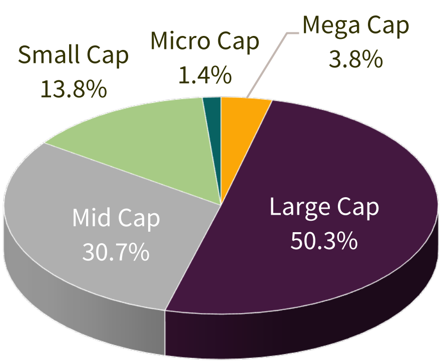
Portfolio Allocations

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.

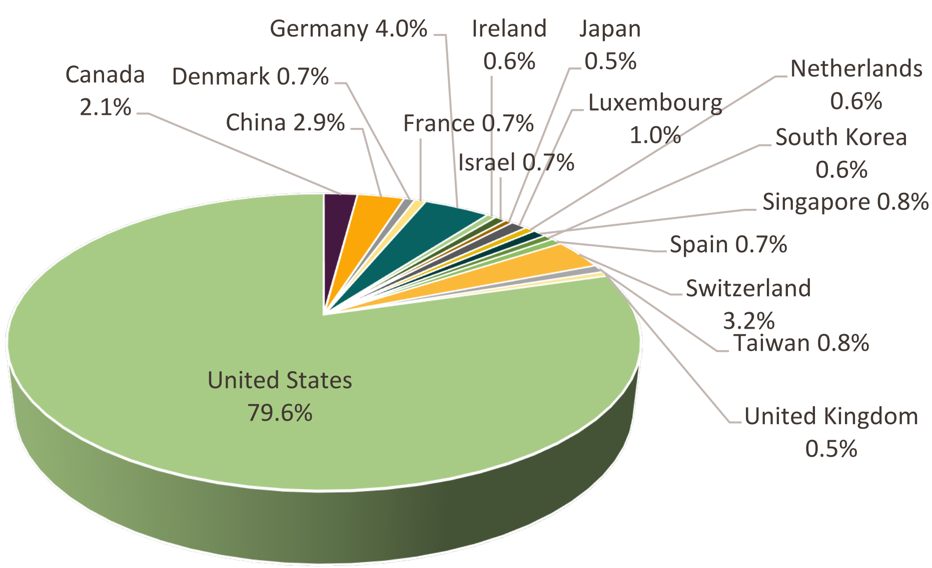
Economic Sectors



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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- 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. The Next Economy Index 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 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.
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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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