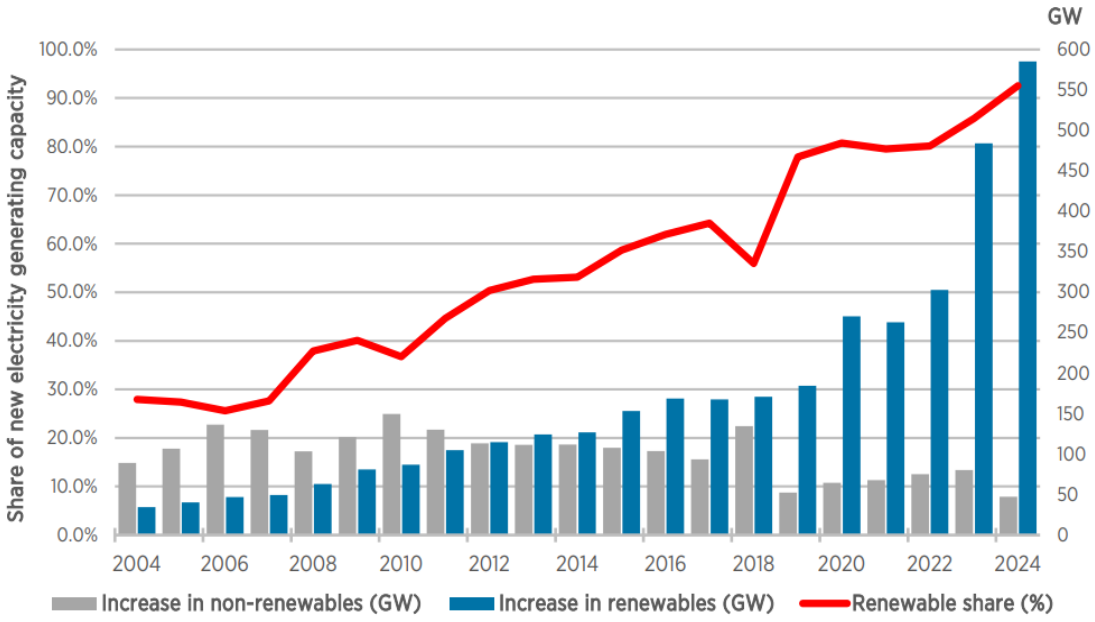
Chart of the Month: Renewables Additions

According to IRENA (International Renewable Energy Agency), renewables made up 92.5% of all new capacity additions in 2024, a material increase from 85.8% in 2023. As a result, renewables now account for 46.4% of total installed power capacity globally, up from 43.1% the previous year. Renewable share gains have been driven by both the increasing adoption of renewable technologies and continued net decommissioning of fossil fuel capacity. China remains the dominant driver of the renewables build out, followed by the US.

Renewable share of annual power capacity expansion



Source: IRENA, 2025

News

- Global electric vehicle (EV) sales increased 24% year-on-year in May, according to Rho Motion. EV sales in China surpassed one million units in a single month for the first time in 2025, with strong domestic demand and an emerging export market driving sales growth. EV sales in Europe rose 36% year-on-year as the market continues to benefit from supportive and consistent policy in key regions such Germany and the UK. Despite registering 7.5% year-on-year growth, EV adoption in North America continues to be impacted by tariff uncertainty and wavering policy support.
- In May, China set a new global record by installing 93 gigawatts (GW) of solar power capacity in a single month. A surge in installations had been expected as developers rush to complete projects ahead of incoming policy changes in June that adjust pricing policies and enhance grid connection requirements to better integrate renewables into the broader energy system. As a result, China's total solar additions for the first five months of 2025 reached 198 GW, averaging over 1 GW per day.
- In another sign of renewed momentum for the U.S. nuclear industry, Meta has signed a 20-year agreement to purchase the full output of the Clinton nuclear plant in Illinois, starting in 2027. This deal helps Meta secure stable, carbon-free power to fuel its energy-intensive AI (artificial intelligence) ambitions. In the US, both utilities and technology firms face tightening electricity supplies as the country faces an inflection in power demand for the first time in decades due to the proliferation of AI datacenters.

- Despite a slowdown in overall M&A (mergers and acquisitions) activity, BNEF (Bloomberg New Energy Finance) have reported that the number of climate-tech-related transactions reached their highest level in 3 years in the first quarter of 2025. Deal making activity was highest in the US and in particular in the Energy Storage sector, led by Rio Tinto's $6.6 billion acquisition of Arcadium Lithium. As previously discussed, attractive valuations and increasing power demand continue to drive M&A activity in the sustainable energy space, with Reuters reporting that there were 27 deals in the first two months of the year alone in the US worth a combined $36.4bn.
- China is undertaking a significant transformation of its power grid, with State Grid Corporation of China announcing plans to invest over 650 billion yuan ($89 billion) in 2025 alone. This substantial investment aims to address the challenges posed by the rapid expansion of renewable energy sources, such as solar and wind, which have outpaced the current grid's capacity to efficiently distribute power. The funds will be directed towards enhancing ultra-high-voltage transmission lines, upgrading distribution networks, and integrating advanced technologies like smart grid systems and energy storage solutions. These efforts are crucial for reducing renewable energy curtailment and ensuring a stable and flexible power supply to meet the country's growing energy demand.

Manager's Comments

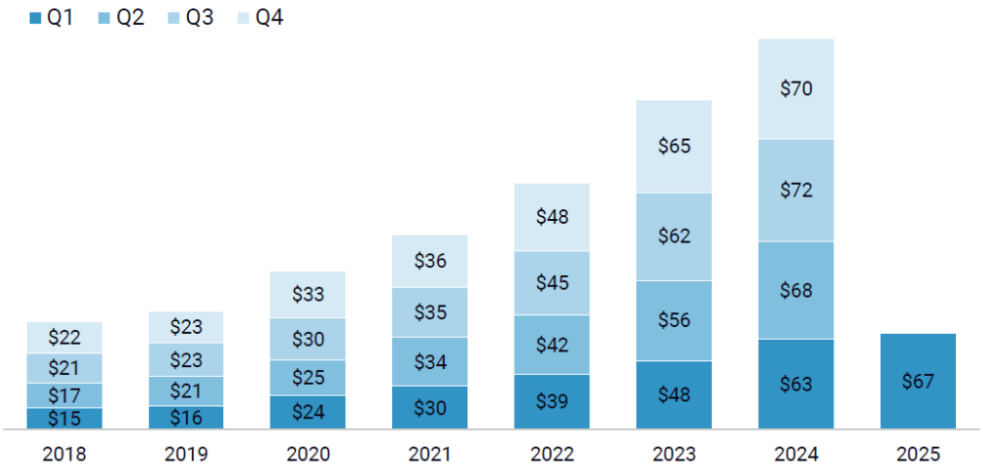
The first half of 2025 saw a scaling back of the Inflation Reduction Act (IRA) as part of Trump's One Big Beautiful Bill and, with it now behind us, we expect the US clean energy industry to return to investment mode again. Clarity following the IRA, together with more European policy support, an improving macro environment and resurgent electricity demand growth allowed the sector to outperform markets over the period, and we see reasons for cautious optimism in the second half. In this report, we review 1H 2025 macro developments and fund contribution.

The first half of 2025 saw the Guinness Atkinson Alternative Energy Fund delivering a total return of 12.13%, outperforming the MSCI World Index (net return) of 9.47%. The key events that have affected the energy transition, company profitability and share price performance so far this year are discussed below:

The backdrop to the global energy transition in 1H'25 has been dominated by policy; with the United States delivering a disappointing downsizing of the Inflation Reduction Act (IRA) and tariff uncertainty while Europe provided leadership and direction in the energy transition.

In the **United States**, the budget reconciliation bill of May 2025 initially proposed fewer changes to the IRA than expected after President Trump's election. However, amendments by the House of Representatives in late May reduced the value of IRA credits, raising around $570bn. The resulting One Big Beautiful Bill eliminates electric vehicle and residential solar tax credits and speeds up the phasing out of utility solar and wind ITC and PTC tax credits. On the positive side, manufacturing tax credits for battery and solar equipment will last until 2032 (beyond previous expectations) with wind credits set to end in 2027. While the new bill is less favorable for clean energy, its passing will provide project developers with the certainty needed to plan and proceed. Our dialogue with OEMs (original equipment manufacturers) and developers indicate that the planning scenario for many following the Trump election was for a full repeal of the IRA and that little activity would occur while the bill was under consideration. With this hurdle now cleared, we expect to see a resumption of activity in the US, from what we see as an encouraging base level of activity, unabated by recent policy headwinds.

US Clean Investment (Energy, Vehicles, Building Electrification) continues to grow, in spite of policy headwinds



Source: Rhodium Group / MIT-CEEPR Clean Investment Monitor, 2025

In contrast, **European** policy has been supportive of the Energy Transition this year. February saw the European Commission introduce the Clean Industrial Deal, a policy aimed at boosting the EU's clean manufacturing sector and industrial competitiveness by adding 100GW of renewable energy capacity annually until 2030 and making €100 billion available to support energy-intensive industries such as steel, metals, and chemicals. The deal also proposes streamlining bureaucratic processes, increasing European Investment Bank-backed guarantees for renewable energy projects, and supporting power grid manufacturers. In addition, Germany's debt brake reform (Feb'25), unlocks approximately €1 trillion (approx. $1.17 trn USD) in additional investment into defense, infrastructure and energy transition projects over the next decade. Importantly, the case for renewables investment in Europe has not been shaken by the Iberian blackout in April 2025, with the cause believed to be poor load control and frequency management, rather than the high share of solar (55%) deployed at the time.

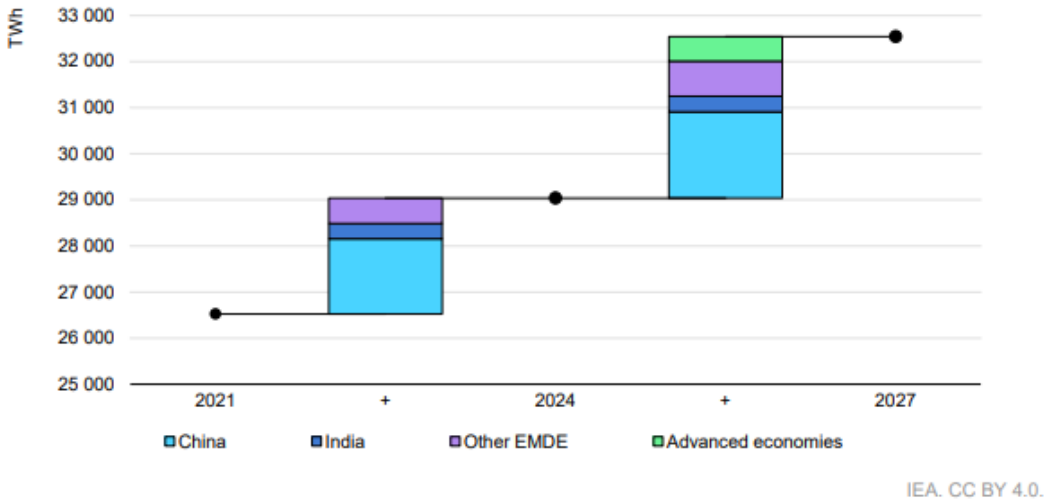
Despite the trade and policy uncertainty, the fundamental **macro backdrop** in the first half of 2025 has proved to be fairly supportive of the sector. Interest rate cuts have continued in Europe, as inflation remains well under control. In the US, rates remain flat year to date at 4.5% (down ~100bps vs. Jun'24) and US Inflation has trended downwards year to date (2.3% in May'25 following a resurgence in Q4'24) creating some capacity for further interest rate cuts.

This backdrop has been somewhat overshadowed by the uncertainty, inflationary, and recessionary pressure introduced by the swathe of **tariffs** threatened by the Trump administration following its "Liberation Day" announcements in April. Whilst the extraordinary headline tariffs have been delayed and reduced, uncertainty persists, and some consequential tariffs will certainly be implemented. A blanket 10% universal tariff on all non-Canadian / Mexican exempted goods is in effect, alongside 50% on steel and aluminum products and 25% on cars and auto parts. Chinese goods face a 30-55% tariff, with further tariffs facing a 90 day pause following the Geneva trade negotiation in May. We are encouraged by the commentary of our investee companies, which generally operate "in-region, for-region" manufacturing strategies to minimize cross border tariff exposures.

Despite the policy, macro and trade uncertainty, **global investment** in clean technologies remains on track to hit nearly $2.2tn in 2025 (according to the International Energy Agency (IEA)), 10% more than 2024 and almost twice the spend on coal, oil and gas. Investments in power grids, renewable energy and electrified transport lead the way with China accounting for around a third of the total and EU (+12.4% CAGR 2019-24) and US (+9.2% CAGR (compound annual growth rate) 2019-24) investments also delivering resilient growth. Notably, this surge is occurring despite the aforementioned policy, macro and trade uncertainties, demonstrating that electricity generated from renewable sources like onshore wind and solar remains cost-effective versus fossil fuels.

A key driver of the acceleration in clean technology investment, is the acceleration in **global electricity demand**. Having grown at 2.8%pa between 2000-23, global electricity consumption grew by an estimated 4.3% in 2024 and is expected to maintain a higher level of growth going forwards, averaging ~4%pa in 2025, and remaining at this elevated level until 2027. Importantly, load growth demand is increasingly coming from developed economies, such are the power demands of datacenters, particularly those supporting AI. The US, for example, is expected to see load growth of 2-3% in 2025, sharply higher than the 0.5% p.a. seen in the prior twenty years.

Developed economies will contribute to global electricity growth for the first time in two decades



Source: IEA, 2025

One of the key drivers of developed market electricity demand growth is **datacenters**, whose owners are increasingly looking to renewables to meet their growing electricity needs, helping to drive global corporate **power purchase agreement (PPA)** volumes to new highs. According to Bloomberg New Energy Finance, total signed agreements of around 60GW (gigawatts) in 2024, up nearly 40% year-on-year. The top four buyers—Amazon, Google, Meta, and Microsoft—accounted for 40% of total demand last year. Approximately 95% of these agreements in the US were for onshore wind and solar, with predictable operating costs making them well suited for long-term contracts, offering long term price visibility to hyperscalers, a distinct advantage over fossil fuels. The increased demand has driven US PPA prices from $25/MWh (megawatt hours) in 2019 to over $60/MWh today, with prices exceeding $100/MWh for some geothermal contracts.

We believe that renewables are being chosen to help satisfy this demand growth due to their speed to market, flexibility, and cost advantages over competitor technology. According to NextEra Energy, new US nuclear generation will take more than 10 years to deploy and will be the most expensive source of generation

available. Meanwhile, natural gas power projects are experiencing significant cost inflation and extended build times with logistical constraints.

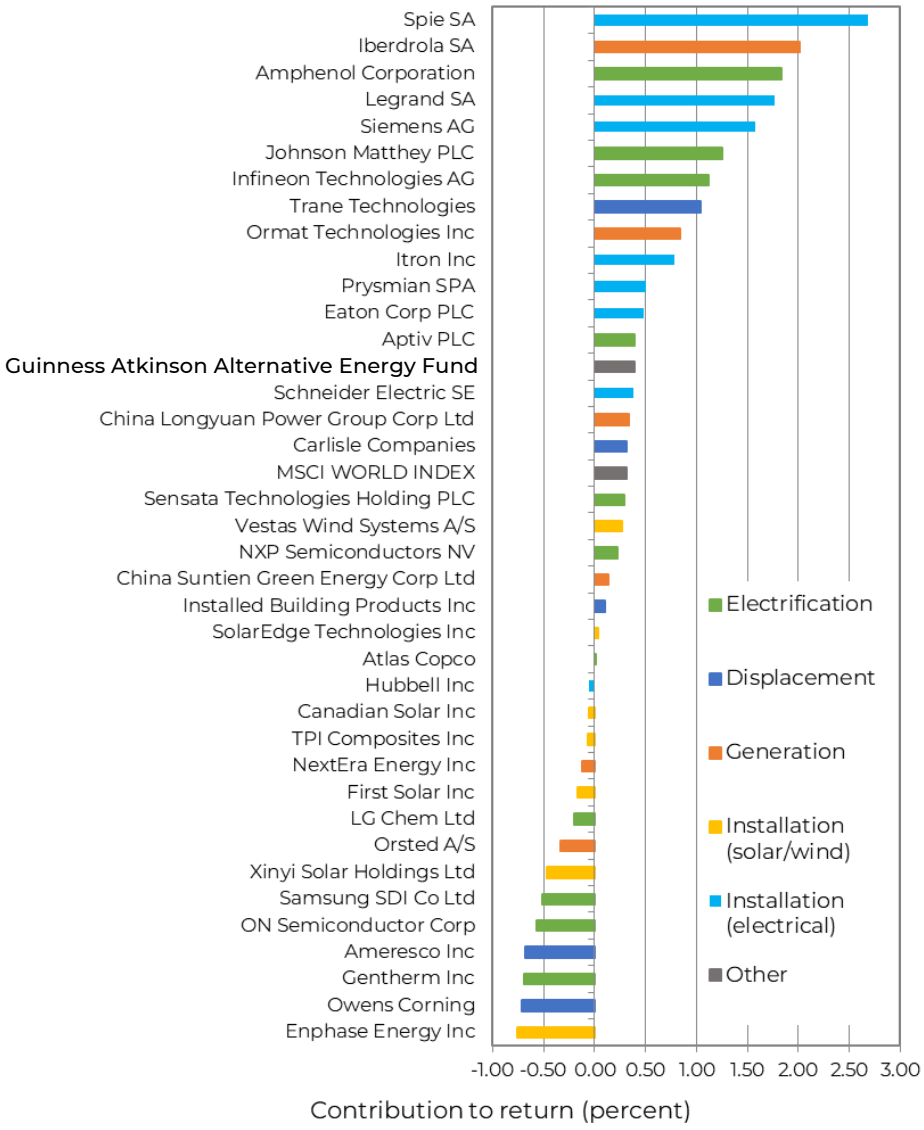
The Guinness Atkinson Alternative Energy Fund

The Guinness Atkinson Alternative Energy Fund delivered a return of +12.16% during the first half of the year, outperforming the MSCI World Index (+9.47%). Global equity markets suffered significant volatility, with the US underperforming Europe post the "Liberation Day" tariff announcements and then recovering somewhat thereafter. Europe's outperformance was fueled by defense and infrastructure spending, supported by a weaker dollar.

Within our portfolio, the top contributing segments were our electrical installation and electrification sectors, while underperforming segments included our solar/wind equipment and auto-exposed electrification names. We are encouraged at the diversity and breadth of contribution within the portfolio, with our top ten contributors equally split across US and Europe and representing all five of our master themes. Key discussion points were as follows:

- Our electrical equipment companies all performed well, driven by an acceleration in global electrification activity, grid spending and, in select cases (such as **Legrand**), exposure to the data center sub-sector. Top contributor **SPIE** delivered upgraded guidance at its Capital Markets Day and benefitted from higher German infrastructure spending.
- **Amphenol** shares performed strongly, having materially beaten revenue and operating margins expectations in 1Q results. Amphenol's IT interconnect solutions "IT Datacom" segment delivered +134% YoY growth (reflecting data center and AI exposure) while four of its seven non-AI end markets posted mid-teens or better growth.
- Deal activity remained strong within the space, with **Johnson Matthey** contributing well having accepted a bid for its Catalyst Technologies division for £1.8bn (approx. $2.45 bn USD) from Honeywell, at an implied attractive valuation of 15x TTM EBITDA (earnings before interest, taxes, depreciation, and amortization). Management plan to return ~£1.4bn (approx. $1.90 bn USD) (60% of current market cap) to shareholders once the deal is closed.
- Poorer contributors covered various themes and end markets. **Enphase** was directly affected by the cuts in subsidy to residential solar tax credits, **Gentherm** suffered from auto cycle weakness and uncertainties around Trump's tariffs while **Owens Corning** suffered after highlighting weakness in the North America Residential market. **Ameresco** was weak after management noted some uncertainty around federal government projects in its $2.5 billion backlog of contracted projects.

1H 2025 contribution for Guinness Atkinson Alternative Energy Fund



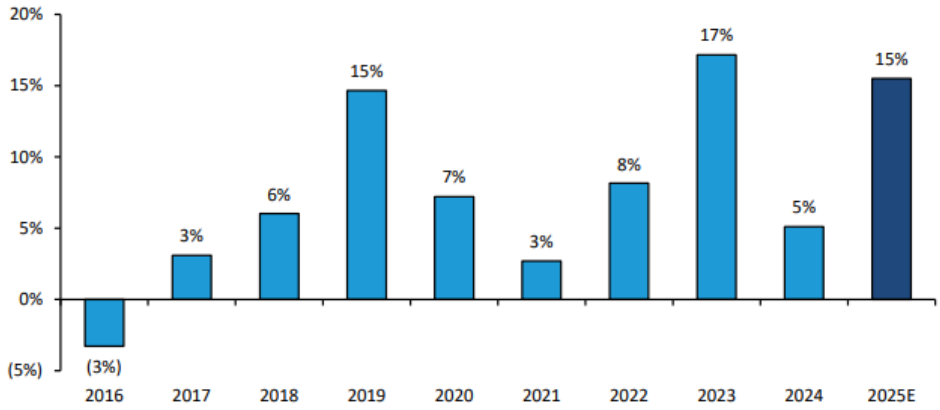
Source: Bloomberg, Guinness Atkinson estimates, June 30, 2025

Outlook

Looking to the remainder of 2025 and beyond, we expect stabilization in the transition after an erratic first half, giving way to more benign macro and market conditions, conducive to long term growth:

- **Renewable power generation** is expected to grow ~1,200 TWh (terawatt hours) in 2025 (+12%), as demand from AI and datacenters increases. This is against a backdrop of US electricity demand growth of ~2-3%, following a decade ex-growth where electrification was offset by efficiency gains.
- **Grid investment** will increase to support the growth, growing at 15% in the US in 2025 (twice its historic rate of 7%pa) from a base of near $90bn in 2024 Growth reflects the delivery of federal upgrade funds through the Infrastructure Investment and Jobs Act (IIJA), underlying electricity demand growth and the growing need for battery storage.

Year on Year (%) Change in US Electrical Utilities Capex



Source: Bernstein, June 2025

- **Building efficiency and electrification** will see sharply greater investment, increasing from $340bn in 2022 to $600bn per year from 2026-30 (10% annual growth versus a historic rate of 5%) driven by energy security, economics and tightening building standards. The EU Clean Industrial Deal (Feb'25) added various new energy efficiency targets while US policy continues to support efficiency in the construction, industrial and power sectors.
- **EV sales should be around 22 million in 2025**, representing around 25% of total passenger vehicle sales. Technological innovation in the space remains strong, with the first EVs able to offer recharging times competitive with ICE (internal combustion engine) refueling now being made available. Whilst China remains the only scaled market where EVs are on average cheaper to buy than comparable ICE vehicles, we continue to expect the global EV/ICE parity benchmark of $100/kWh batter prices to be reached in 2027, supporting 50% global penetration by 2030.
- **Solar** remains the cheapest form of new electricity supply and we expect record low module prices in 2025 to spur growth in all major geographies with full-year global installations likely close to 695 GW in 2025, up nearly 15% on 2024. China will still represent around half of all installations with European and North America solar demand set to rise to 78 GW and 48 GW respectively, with a larger share being solar+storage deployments.
- The global **wind** industry is on track to deliver a record level of ~143 GW of installations in 2025, with China being less than half of the market. For wind equipment manufacturers (OEMs) the outlook for margins is attractive as the pricing of new order intake remains elevated while raw material costs have stabilized, potentially allowing gross margins to maintain recent higher levels in 2H 2025. US policy uncertainty has brought a lower level of new orders in the first half of the year.

The outlook we summarize here is broadly consistent with current government activity and observable investment plans. To be clear, however, the growth described falls well short of the energy transition activity needed to achieve a **net zero / 1.5 degree scenario** in 2050, as targeted by the IPCC (Intergovernmental Panel on Climate Change) and reiterated at COP28 (the 28th United Nations Climate Change Conference). In a net zero scenario, the deployment of renewable generation capacity, penetration of EVs and battery storage, use of alternative fuels and implementation of energy efficiency measures will need to accelerate markedly.

Bloomberg New Energy Finance notes that the number of climate-tech M&A deals with a value of over $1 billion dollars has increased from 13 in 2022 to 20 in 2024, with three in Q1'25 alone, a quarter which saw the largest number of deals in the last three years (79).

Catalysts for the rest of the year include the return of policy clarity in the United States as well as funding announcements related to the EU Green Deal or European energy security. The sector would also be a beneficiary of looser monetary policy, lower inflation and lower US treasury yields while higher fossil fuel prices would further improve the relative economics of renewable technologies. We expect investor interest in sustainable energy equities to recover in 2H'25 reflecting these catalysts and we expect that the current attractive valuation level will act as a catalyst as well.

We believe that the Guinness Atkinson Alternative Energy portfolio of approximately 30 broadly equally weighted positions, chosen from our universe of around 250 companies, provides concentrated exposure to the theme at attractive valuation levels that are particularly attractive relative to consensus earnings growth expectations.

Performance

As of 6/30/2025	YTD	1 Year	3 Years	5 Years	10 Years
GAAEX	12.13%	2.61%	2.63%	9.88%	4.89%
MSCI World Index NR	9.47%	16.26%	18.29%	14.54%	10.65%

All returns after 1 year annualized.

Inception 03.31.2006 Expense ratio*1.10% (net); 1.76% (gross)

Performance data quoted represents past performance; past performance does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the Fund may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by visiting www.gafunds.com or calling 800-915-6566.

* The Advisor has contractually agreed to reduce its fees and/or pay Fund expenses (excluding Acquired Fund Fees and Expenses, interest, taxes, dividends on short positions and extraordinary expenses) in order to limit the Fund's Total Annual Operating Expenses to 1.10% through June 30, 2028. To the extent that the Advisor absorbs expenses to satisfy this cap, it may recoup a portion or all of such amounts absorbed at any time within three fiscal years after the fiscal year in which such amounts were waived or absorbed, subject to the expense cap in place at the time recoupment is sought, which cannot exceed the expense cap at the time of the waiver. The expense limitation agreement may be terminated by the Board of the Fund at any time without penalty upon 60 days' notice.

Top 10 Fund Holdings as of 6/30/25:

1. Legrand SA 4.97%
2. Iberdrola SA 4.93%
3. Eaton Corp PLC 4.91%
4. Schneider Electric SE 4.83%
5. Siemens AG 4.78%
6. Trane Technologies PLC 4.77%
7. Hubbell Inc 4.55%
8. Amphenol Corp 4.30%
9. Spie SA 4.21%
10. Nextera Energy Inc 4.16%

MSCI World Index captures large and mid cap representation across 23 Developed Markets countries. With 1,546 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

Fund holdings and/or sector allocations are subject to change at any time and are not recommendations to buy or sell any security.

One cannot invest directly in an index.

Earnings Growth is not a measure of future performance.

Opinions expressed are subject to change, are not guaranteed and should not be considered investment advice.

The Guinness Atkinson Alternative Energy Fund's investment objectives, risks, charges and expenses must be considered carefully before investing. The statutory and summary prospectuses contain this and other important information and can be obtained by calling 800- 915-6565 or visiting www.gafunds.com. Read and consider it carefully before investing.

The Fund invests in foreign securities which will involve greater volatility and political, economic and currency risks and difference in accounting methods. The risks are greater for investments in emerging markets. The Fund also invests in smaller and mid-cap companies, which will involve additional risks such as limited liquidity and greater volatility than larger companies. The Fund's focus on the energy sector to the exclusion of other sectors exposes the Fund to greater market risk and potential monetary losses than if the Fund's assets were diversified among various sectors.

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