SOLR

Guinness Atkinson Sustainable Energy ETF

December 2025 Update

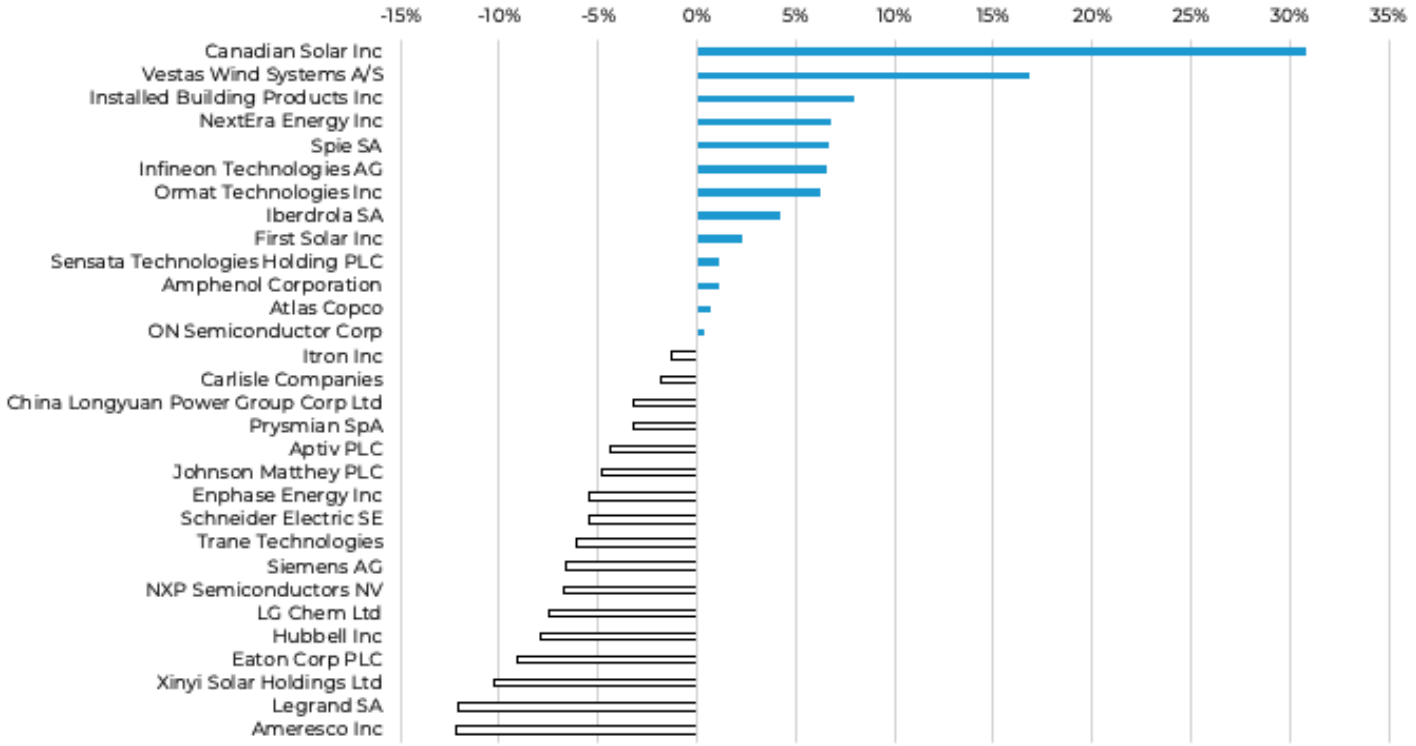
GUINNESS ATKINSON FUNDS

Portfolio Performance

as of 11/30/2025

In November, SOLR was down -1.44% (on both a NAV and market price basis), while the MSCI World Index benchmark was up 0.28%.[1] Canadian Solar and Vestas were among the fund's top performers, supported by strong third-quarter results and healthy order growth. In contrast, AI-related holdings Legrand and Eaton lagged due to volatility and concerns about the long-term sustainability of AI data center growth. This month's update reviews key outcomes from COP30 and highlights the significant changes needed across sustainable energy subsectors to achieve a net zero transition. Keep reading for more insights on SOLR.

Holdings are subject to change. Go to www.gafunds.com/our-funds/SOLR/ for current holdings.



Top Performer: ***Canadian Solar Inc., 30.8% TR Month to Date*** | Canadian Solar shares performed strongly in month after reporting strong Q3 2025 results that pointed to continued operational resilience amid a challenging solar module pricing environment. The company delivered record energy storage shipments of 2.7 GWh (gigawatt hours) and gross margins of 17.2%, which exceeded guidance despite lower module volumes. The company's focus on high-margin storage

[1] *Performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment in the Fund 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 data quoted. Performance data current to the most recent month-end may be obtained by visiting gafunds.com, or calling (866) 307-5990. The returns shown are cumulative for the period, not annualized. Market prices return is based on the market price of Fund shares as of the close of trading on the exchange where the shares are listed.*

solutions and profitable North American markets supported revenues at the top end of expectations, while strategic progress on U.S. manufacturing bolstered investor confidence.

Bottom Performer: ***Ameresco Inc., -12.2% TR Month to Date*** | Despite reporting Q3 earnings ahead of consensus, Ameresco shares have underperformed in the month due to investor concerns about the company's growth outlook. Although management stated that there's been no impact on the business from the Federal government shutdown, the company's conservative guidance suggests caution and puts growth below peers. Although management reiterated its previous guidance, the business has a strong backlog and should benefit from the continued fall in interest rates.

As of 11/30/2025	1 Month	YTD	1 Year	3 Years	5 Years	Since Inception (11/11/20)
SOLR at NAV	-1.44%	27.26%	16.73%	1.43%	4.68%	5.37%
SOLR at Market Price	-1.44%	27.87%	16.42%	1.07%	4.57%	5.68%
MSCI World Index NR	0.28%	20.12%	16.99%	19.09%	12.89%	13.25%

As of 09/30/2025	1 Month	YTD	1 Year	3 Years	Since Inception (11/11/20)
SOLR at NAV	29.62%	16.93%	5.67%	6.82%	8.07%
SOLR at Market Price	29.62%	16.93%	5.67%	6.82%	8.07%
MSCI World Index NR	19.78%	22.02%	21.67%	15.57%	11.78%

Expense Ratio: 0.79% (net) | 3.12% (gross)

The Adviser has contractually agreed to reduce its fees and/or pay ETF expenses in order to limit the Fund's total annual operating expenses to 0.79% through June 30, 2028.

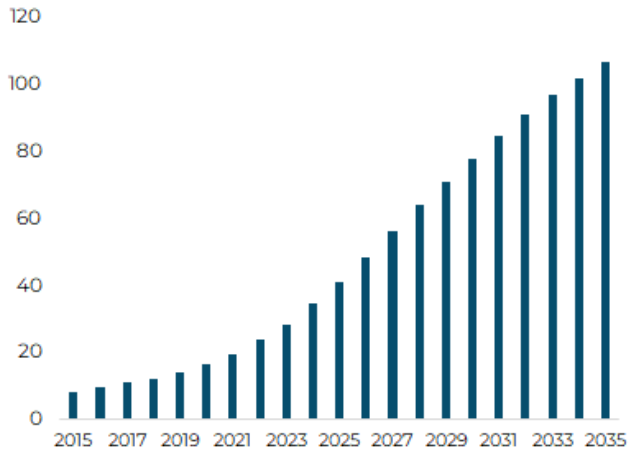
Performance data quoted represents past performance and does not guarantee future results. The investment return and principal value of an investment in the Fund will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the Fund may be lower or higher than the performance data quoted. Performance data current to the most recent month-end may be obtained by visiting gafunds.com, or calling (866) 307-5990. The returns shown are cumulative for the period, not annualized. Market prices return is based on the market price of Fund shares as of the close of trading on the exchange where the shares are listed.

A fund's NAV is the sum of all its assets less any liabilities, divided by the number of shares outstanding. The market price is the most recent price at which the fund was traded.

Interesting News

- Bloomberg New Energy Finance (BNEF) see power demand from US data centers growing by 106GW over the next decade, up from 41GW in 2025. At the same time, the proliferation of AI means that inference and training will account for nearly 40% of data center capacity, driving up overall utilization from 59% to 69%.

US Data Center Power Demand (Gigawatt)



Source: BNEF estimates, August 2025

- In another sign of the vast investment required to support accelerating AI growth, Brookfield Asset Management, alongside Nvidia and the Kuwait Investment Authority, has launched a $100 billion AI infrastructure program. The capital will be used to acquire and develop critical assets including land, power generation, data centers and compute capacity. Brookfield estimates that AI-related infrastructure could require as much as $7 trillion of global investment over the coming decade, highlighting the unprecedented scale of the build-out. With energy consumption now a central bottleneck for AI expansion, the partnership highlights how securing reliable, large-scale power will be as essential as compute in meeting future demand.
- In November, the US government granted Constellation Energy a $1 billion loan to restart the Three Mile Island reactor, demonstrating its support for the domestic nuclear sector. The move builds on recent federal efforts to rebuild infrastructure, secure supply chains, and accelerate deployment timelines to meet rapidly rising power demand. Constellation is restarting the plant to supply electricity to Microsoft, reflecting a broader trend of reactor restarts and life extensions. It follows last month's announcement of an $80 billion US government deal with Westinghouse to deploy a new fleet of reactors nationwide.
- In November, British utility SSE announced a £2 billion (approx. $2.7 bn USD) equity raise to support its five-year, £33 billion (approx. $44.5 bn USD) investment plan aimed at upgrading the UK's electricity networks and expanding its renewables portfolio. The company expects around 80% of this spending to go toward strengthening its regulated networks business, with the remainder directed to new renewable and flexible-generation assets. The move follows similar capital raises by Iberdrola and National Grid in recent years and shows the scale of investment required to modernize ageing UK infrastructure, integrate renewables at pace, and meet rising electricity demand as the country accelerates its transition to a decarbonized energy system.
- Global electric vehicle (EV) sales increased 23% year-on-year in October, reaching 1.9 million units, according to research house Rho Motion. Sales in Europe experienced the strongest growth, up 36% in the month, with strong demand seen in Germany, France, and the UK. Sales in China reached approximately 1.3 million units, with buying expected to accelerate further ahead of subsidy cuts in

the new year. In contrast, the phase-out of North American tax credits has pushed regional sales lower, leaving the market trailing other major regions.

- The International Energy Agency (IEA) released its latest World Energy Outlook, which for the first time included a "Current Policies Scenario" in which oil demand continues to grow through 2050. The report highlighted the strong structural drivers of energy use, including economic growth in emerging markets and rapidly rising electricity demand from industry, mobility and data centers. Although renewables and nuclear continue to expand at record pace, they are not yet scaling fast enough to offset demand growth, leaving fossil fuels entrenched in the energy mix. The report highlights the need for sustained investment in both clean energy deployment and grid and generation resilience in order to meet growing global demand.

Investment Team Commentary

COP30 and the Energy Transition

This month, we review some of the key outcomes of COP30 and the implications for the energy transition. While the long-held goal of limiting global temperature increases to 1.5°C was reaffirmed, updated nationally determined contributions (NDCs) still imply warming well in excess of 2°C. We assess the conclusions of COP30 and discuss the changes that would be required across the sustainable energy subsectors to deliver a net zero transition.

COP30 concluded on November 21st, marking the tenth anniversary of the Paris Agreement and the adoption of global efforts to limit warming to 1.5°C. As part of the Paris Agreement's five year "ambition-raising" cycle, COP30 also required members to submit their updated NDCs, with mitigation targets and measures to 2035.

While this year's summit delivered incremental progress in key areas such as adaptation financing and developing emerging frameworks to support a just transition, it ultimately fell short in delivering the material step up in ambition needed to realign global emissions with a 1.5°C scenario. In our view, the absence of a concrete commitment to phase out fossil fuels means that COP30 will ultimately be viewed as a missed opportunity to build on the achievements of previous climate conferences.

However, from the perspective of investing in the energy transition, we found the following developments to be particularly interesting.

Progress on Climate Financing

Climate finance had a lesser role on the COP30 agenda than in previous years, but the summit delivered a handful of noteworthy developments. Chief among these was a commitment to "at least triple adaptation finance by 2035", signaling a growing recognition that resilience investment must scale significantly as climate impacts intensify. Delegates also reaffirmed the New Collective Quantified Goal (NCQG) to channel $300 billion per year in climate finance to developing economies, alongside the release of a report outlining a strategy to mobilize the $1.3 trillion referenced in the "Baku to Belém Roadmap to $1.3T" framework in COP29.

Renewed commitment to renewables and efficiency

Building on the commitments made at COP28, a coalition of more than 80 countries including the EU and its member states renewed their pledge to transition away from unabated fossil fuels, triple renewable capacity and double energy efficiency by 2030. This reaffirmation of one of COP28's central outcomes points to the growing recognition of the importance of not only accelerating clean energy deployment but also driving substantial efficiency gains in buildings, industry and transport.

Within the area of efficiency, there was also explicit action taken with the release of Mission Efficiency's detailed implementation plan. Mission Efficiency is a global coalition backed by governments, international organizations and industry partners with the mandate to support delivery of the COP28 goal to double global energy-efficiency improvements by 2030. Its COP30 plan sets out concrete policy, technology and financing measures to accelerate efficiency gains across the built environment, industry and transport.

As well as the headline announcements, other commitments included the following:

- **Transition investment**: Members of the Utilities for Net Zero Alliance, a coalition of major power and grid companies, announced commitments to increase transition investment by 25% to $150bn per year, split as $66bn in renewables and $82bn in grids. The updated investment plan means the members of the Alliance will mobilize more than $1 trillion in energy transition investments by 2030.
- **Sustainable Fuel**: commitment to quadruple the production and use of sustainable fuels by 2035, endorsed by a group of 23 countries including Brazil, Italy, Canada and Japan.

Recognition of the need to work outside the COP timelines

Another interesting development from COP30 was a willingness among countries, and indeed the presidency itself, to create transition plans and roadmaps outside the formal COP negotiation process. Brazil's commitment to develop voluntary frameworks on fossil-fuel transition and deforestation underscores a pragmatic move towards implementation, even when consensus cannot be reached within the usual negotiating channels. While non-binding, these parallel initiatives can still play a role in advancing clean-energy strategies and accelerating planning cycles.

Implied warming from NDCs, pledges and targets

To contextualize the outcomes of COP30 and the wider energy transition, we summarize some of the key findings from the UN's latest Emissions Gap Report. While the report acknowledges the significant progress made since the adoption of the Paris Agreement, its analysis finds that the emissions gap – the difference between estimated greenhouse gas emissions implied by the latest NDCs and the level of emissions consistent with the 1.5°C target of the Paris Agreement – remains stubbornly high.

According to the UN:

- **Updated NDCs still leave the world on a 2.3-2.5°C warming path**: even if all announced unconditional NDCs are fully implemented, estimated global warming will reach 2.3-2.5°C, well above the 1.5°C target of the Paris Agreement.
- **Under existing policies, warming could approach 2.8°C**: existing policies imply a warming trajectory closer to 2.8°C, assuming no further tightening. Even then, many countries are not on track to deliver their 2030 pledges, meaning that temperature rises could exceed 2.8°C.

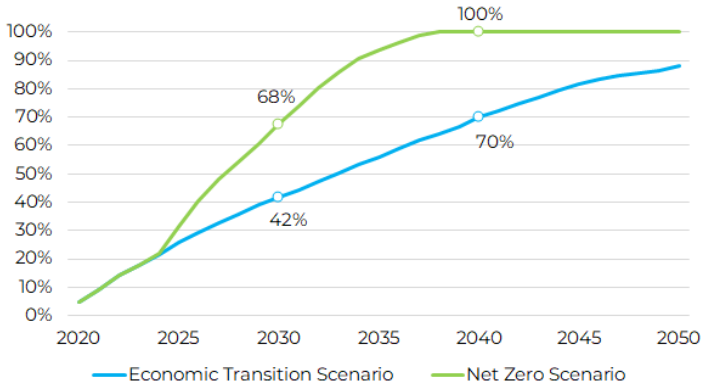
- **The updated NDCs have had a marginal impact**: The modest improvement from last year's 2.6-2.8 °C (NDC scenario) to 2.3-2.5 °C mostly reflects methodological updates; the underlying ambition increase in new pledges is limited and will potentially be offset by the departure of the US in 2026.

Implications of a net zero scenario

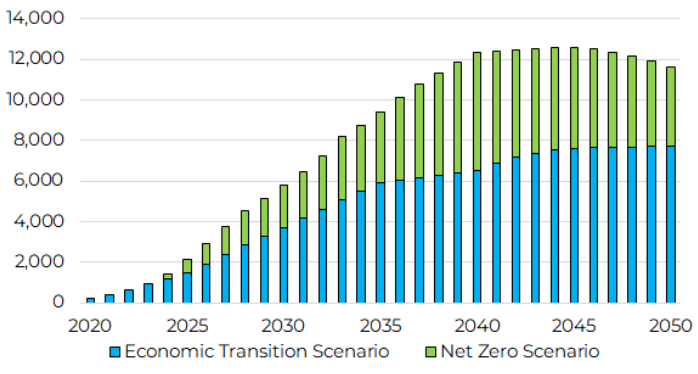
The UN's Emissions Gap Report points to many of the same conclusions as our base-case energy transition scenario. As we understand it, the industry's current capacity and plans to provide decarbonization solutions have accelerated meaningfully in the last decade but still fall short of the level required to meet the goals of the Paris Agreement. We highlight the following changes across our subsectors that would be required to deliver a net zero transition:

- Within **efficiency**, the IEA estimate that annual energy intensity improvements must quadruple from c.1% in 2024 and average 4% per year throughout the rest of the decade. For buildings, this means that efficiency investments grow from $240bn today to reach $600bn per year to 2035. For transport and industry, average energy efficiency investment must nearly double, reaching c.$160bn and c.$70bn per year. It is worth noting that our base case scenario already assumes significant energy efficiency gains with world energy demand forecast to grow at 1% per year, half the historic rate of 2% per year.
- **Alternative fuel** production growth would need to more than double by 2030 from 2023 levels (implying 11% per year growth) and then double again by 2050. Sustainable aviation fuel (SAF) would have to grow from 0.3% of global jet fuel in 2024 to around 10% in 2030 (substantially higher than our base case 2030 estimate of around 2%), before reaching 20% in 2050.
- For **electric vehicles** and **batteries**, BNEF estimate that in a net zero scenario, global EV penetration rates must hit 68% by 2030 with 100% of vehicles sold being electric by 2040 (versus their current "base case" economic transition estimates of 42% and 70% respectively). This translates into global battery demand of 11.6 TWh in 2050 compared to 1.2 TWh in 2024, almost 50% higher than their base case assumptions.

EV sales penetration forecasts (%)



Lithium-ion battery demand forecasts (GWh)



Source: BNEF, Guinness Atkinson Funds; December 2025

- Solar and wind installed capacity would need to triple 2022 levels by 2030. In doing so, renewable generation would see its share of total generation increase from 32% to 75% by 2035. While investment levels in solar are almost in line with a 1.5°C scenario, IRENA estimate that investment levels in onshore and offshore wind need to be scaled up by three times and eight times respectively.
- For power grids, IRENA estimate that net zero would require annual investment to almost double by 2030, reaching c.$620bn per year. As it stands, only 16% of grid investment in 2024 was directed towards new connections, with the majority going towards replacing ageing assets (44%) and reinforcing the existing grid (40%). At the same time, investment into battery storage needs to more than triple by the end of the decade, growing from c.$50bn in 2024 to $170bn per year in 2030.
- Under a net zero scenario, installed nuclear power capacity needs to grow 70% by 2035, adding 290GW of new generation. By 2050, capacity needs to more than double. New installations must also outpace a wall of retirements from power plants installed in in the 1970s and 1980s which are approaching the end of their useful life. Current industry ambitions to triple nuclear capacity by 2050 would see global capacity reach 1,240GW, around 160GW higher than the IEA's net zero capacity target and would require an additional $900bn of investment.
- According to the IEA, energy investment in the net zero scenario would need to increase from about $3.3trn to $5.6trn by 2035. Overall investment in the power sector would need to almost double by 2035, reaching $2.5trn, with the bulk of that investment ($1.3trn) going toward renewable generation.

Conclusion

Investment in the energy transition continues to accelerate, even if current spending remains short of what is required for a net zero pathway. COP30, together with this analysis, offers a timely reminder of the scale of capital still needed to realign global emissions with long-term climate goals. Encouragingly, with investment continuing to grow, the backdrop for sustainable energy investing remains constructive.

Important Information

MSCI World Index captures large and mid cap representation across 23 Developed Markets countries. With 1,583 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

Earnings per Share is a company's net profit divided by the number of common shares it has outstanding. It indicates how much money a company makes for each share of its stock and is a widely used metric for estimating corporate value.

Investing involves risk, including possible loss of principal.

The Fund's focus on the energy sector exposes it to greater market risk than if its assets were diversified among various sectors. Sustainable energy businesses are subject to various industry risks such as rapid and evolving changes in technology, demand for energy and economic factors as well as governmental polices and regulations. The Fund may invest in multiple countries including emerging markets and international companies which involves different and additional political, social, legal and regulatory risks. The global interconnectivity of industries and companies can be negatively impacted by economic uncertainties, environmental conditions and global pandemics or crises. These events can contribute to volatility, valuation and liquidity issues which could cause the value of the Fund to decline.

Consider the investment objectives, risks, charges and expenses of the Fund carefully before investing. For a prospectus or summary prospectus with this and other information, please call (866) 307-5990 or visit our website at www.gafunds.com. Read the prospectus or summary prospectus carefully before investing.

Shares of the Fund are distributed by Foreside Fund Services, LLC.