

IMPACT REPORT 2024

GUINNESS SUSTAINABLE ENERGY



This is a marketing communication. Please refer to the prospectuses, KIDs and KIIDs for the Funds, which contain detailed information on their characteristics and objectives, before making any final investment decisions.

POSITIVELY DIFFERENT

GUINNESS
GLOBAL INVESTORS

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EXECUTIVE SUMMARY

The Guinness Sustainable Energy strategy invests in companies playing a key role in global decarbonisation, providing a vehicle for investors to align their capital with this positive impact. In this report, we disclose our estimates of the positive impact delivered by companies held by the strategy at the end of 2023, based on calendar year 2023 data.

In the **first section**, starting on page 5, we discuss our sustainable energy universe construction and how the businesses we seek to invest in map to the UN Sustainable Development Goals (SDGs). We conclude that the portfolio holdings map closest to SDGs 7, 9, 11 and 13. To provide a balanced assessment, we also discuss the business activity of some portfolio companies that detracts from the SDGs.

The **second section**, starting on page 11, assesses the positive and negative decarbonisation impact of the strategy's holdings. Our estimates and conclusions are as follows:

- i. The companies held in our portfolio, at the enterprise level, helped to deliver around 95,000 million kWh of energy savings, 29,000 million miles of electrified travel, 54,000MW of clean energy generation capacity and 258,000 GWh of renewable energy generation in 2023.
- ii. The companies in our portfolio sold products and services that help to displace 682 tonnes of CO₂e per \$1m of portfolio assets compared to the continued use of incumbent fossil fuel technologies. For context, this would be equivalent to planting 11,300 tree seedlings, providing energy for 89 homes for a year, avoiding driving 1.74 million miles or displacing the consumption of 1,580 barrels of oil.
- iii. In delivering this positive impact, we estimate that the companies in our portfolio generated an annualised 'carbon cost' of 54 tonnes of CO₂e. Our carbon cost figure is based on Scope 1 and 2 (S1+S2) emissions data adjusted for asset life where available to provide a comparable annualised negative impact figure.
- iv. The aggregate positive impact of companies owned at the end of 2023 increased by +16% year-on-year.

The **third section**, starting on page 19, explains our engagement framework of Disclosure, Target Setting and Incentivisation, with case studies. We also detail some of the climate-related initiatives in which we participate.

Within our **appendices**, starting on page 24, we provide historical and background information on impact alignment, our methodology on SDG and business activity mapping as well as discussion points around impact methodology.

We are mindful that impact reporting is still evolving and that there is room for discussion around the approaches adopted. We rely on calculations made on a best-efforts basis and many of the figures we produce are proprietary and unaudited. However, we include detailed explanations of our methodologies. The estimate for carbon displaced is a proprietary calculation using unaudited numbers and is not equivalent to a carbon offset to Guinness Global Investors or our clients. It illustrates the extent to which the strategy is fulfilling its objective to invest in companies which help facilitate the low-carbon transition. The carbon cost figure is also illustrative and distinct from weighted average carbon intensity. Both are calculated based on the equally weighted model portfolio for the Guinness Sustainable Energy strategy rather than the actual portfolio weights of any investment vehicle applying it. The positive impact is owned by the consumer who purchases the underlying products and services. The glossary in Appendix 5 defines key terms used in the report.

INTRODUCTION FROM THE INVESTMENT TEAM

After the hottest year on record in 2023, it's easy to feel downbeat about the state of the global energy transition. We at Guinness, however, remain optimists.

When we reflect on how the space has evolved over just the past five years, we find the progress truly impressive. According to the IEA, global clean energy investment has grown over 50% from \$1.2tn in 2018 to \$1.8tn in 2023, electric vehicles (EVs) have jumped from 2% to 18% of global passenger vehicle sales and solar installations have more than quadrupled from c.100GW to c.420GW. What's more, 2024 is set to be a record year, with clean energy investment expected to hit \$2tn, EV penetration forecast to reach 20% and BNEF projecting solar installations to be just under 600GW.

All of this progress is translating into improving news for our future climate. Over the past five years, Climate Action Tracker's estimate of global warming by 2100 (based on current pledges and targets) has fallen from 3.0°C to 2.1°C. The Intergovernmental Panel on Climate Change (IPCC) says that emissions must peak before 2025 and Climate Analytics suggests that there is a 70% chance that emissions peaked in 2023. Limiting warming to 1.5°C then depends on the trajectory of the decline in emissions.

China is key to bending the curve, being responsible for over a third of global emissions. And there's more good news here too. Record installations of renewables are helping to displace coal, rapid adoption of electric vehicles is helping to curb oil demand growth, and a shift in China's economy away from real estate has reduced emissions from carbon-intensive materials such as steel and cement. These changes raise the prospect that China's emissions may have peaked in 2023, ahead of Xi Jinping's 2030 target.

We are heartened by the historic agreement made by 130 countries at COP28 to triple the world's renewable generation capacity and double the rate of energy efficiency improvements by 2030. This was one of the recommendations from the world's first global stocktake of the Paris Agreement alongside accelerating efforts to phase down unabated coal power. Despite the view at COP28 that we are not on track to limit global warming to 1.5°C, we believe that a transition towards a low-carbon economy is only likely to accelerate, underpinned by government support and improving economics. Companies that sell products and services which reduce or displace fossil fuel demand are set to capture an outsized share of the growth associated with this multi-decade trend. By delivering concentrated exposure to companies playing a key role in global decarbonisation, the Guinness Sustainable Energy strategy provides a means for investors to align their capital with this positive impact.

Our report starts with an explanation of our philosophy, our thoughts on impact investing, and how we align our universe with climate solutions. We then describe our impact findings, focusing on CO2 emissions displaced by the products and services of our investee companies, and outline some of the areas of negative impact and controversy within our portfolio. We conclude by outlining our approach to engagement and provide case studies of recent engagement activity.

Jonathan Waghorn

Will Riley, CA

Jamie Melrose, CFA, CAIA

PHILOSOPHY

THE ENERGY TRANSITION IS HAPPENING

Over the next 30 years, the world will transition towards a sustainable energy system.

The transition will be driven by five key factors:

- **Population and GDP growth:** By 2050, the US Energy Information Administration (EIA) expects global gross domestic product to more than double, 1.7 billion people to be added to the global population, and energy consumption to increase by over 30%.
- **Climate change:** According to the World Meteorological Organization, 2023 was the hottest year since global records began in 1850, with multiple climate indicators breaching record highs, bringing renewed pressure on governments to ratchet up their climate efforts.
- **Pollution:** Exposure to air pollution is linked to one in eight deaths worldwide, according to the most recent State of Global Air Report from UNICEF. The report found that 99% of the world's population live in places where the air is considered to be unhealthy.
- **Energy security:** The United States, the European Union and China continue to prioritise energy security, offering strong support for the localisation of clean energy production and manufacturing as outlined in policy packages such as the Inflation Reduction Act, the Net-Zero Industry Act and the 14th Five-Year Plan respectively.
- **Economics:** According to Bloomberg New Energy Finance, onshore wind and solar are now the cheapest sources of power generation almost everywhere on the planet, with solar modules now cheaper than at any time in history.



WHAT WE INVEST IN

The Guinness Sustainable Energy strategy's investment objective is to provide investors with long-term capital appreciation by investing in companies that contribute towards reduced global carbon emissions. Specifically, the strategy invests in companies engaged in the generation and storage of sustainable energy, and the electrification and efficiency of energy demand.

Guinness Sustainable Energy strategy exposure by theme

Theme	Example Holdings	Weighting (%)
1 Electrification of the energy mix	 	25.2%
2 Rise of the electric vehicle and auto efficiency	 	21.2%
3 Battery manufacturing		7.3%
4 Expansion of the wind industry		10.1%
5 Expansion of the solar industry		13.3%
6 Heating, lighting and power efficiency	 	15.3%
7 Geothermal		3.3%
8 Other (inc cash)		4.2%

Model weights at 31st December 2023. Source: Guinness Global Investors

WHAT WE DO NOT INVEST IN

The strategy excludes companies which:

- Are involved in the extraction of oil, natural gas or coal;
- Manufacture controversial weapons; or
- Derive over 30% of revenues from thermal coal power generation.

The strategy's exclusions are also consistent with the Norwegian Council on Ethics (Norges Bank) exclusion list, which screens out some of the more carbon-intensive utilities, tobacco, and companies which breach internationally accepted norms.

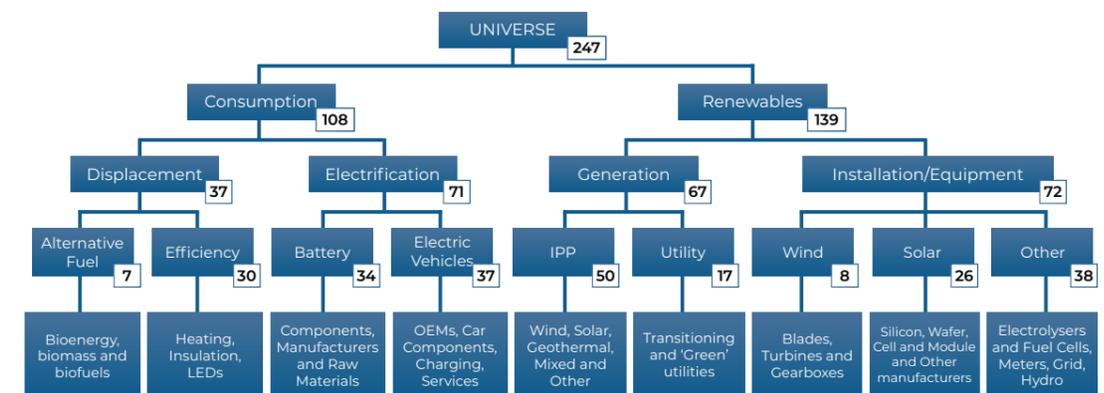
MAPPING TO THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

UNIVERSE CONSTRUCTION

The Guinness Sustainable Energy strategy delivers concentrated exposure to companies in the sustainable energy sector, providing a positive environmental solution for investors' portfolios.

Our investment universe is unique to Guinness Global Investors. It was first created in 2018 by identifying c.600 companies associated with the energy transition. We screened out c.400 companies due to size, liquidity or relevance, leaving an investible universe of around 200 companies. This universe is updated annually and currently stands at around 250 companies at the end of 2023 (the reference point for this report). We apply our investment process and approach to portfolio construction, resulting in an equally weighted portfolio of 30 positions. We do not limit ourselves to 'pure plays', opening our universe up to some companies with existing conventional fuel exposure, but this must be allied with a commitment to transitioning their business models towards sustainable energy sources. Our universe, at the end of 2023, is summarised below:

Guinness Sustainable Energy investment universe



Universe as of 31st December 2023. Source: Guinness Global Investors

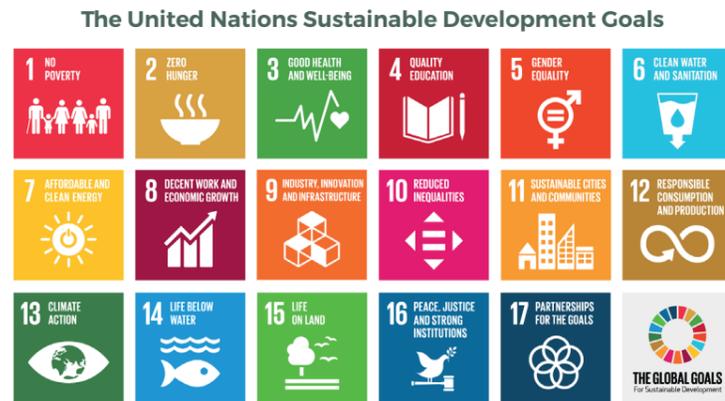
This model has four key sustainable energy subsectors:

- **Displacement:** companies selling products and services which displace energy consumed via improving energy efficiency or providing alternative fuels.
- **Electrification:** companies selling products and services which help to enable electrification of transportation and provide energy stationary storage for the grid.
- **Generation:** utilities and independent power producers (IPPs) with a material proportion of business exposure to low-carbon electricity generation.
- **Installation:** companies involved in installing low-carbon infrastructure, manufacturing finished products (turbines) and key components (solar glass), and services (grid connection).

We believe that the companies which fall into these business areas sell products and services which are vital to delivering the transition towards a low-carbon economy. As we can only invest in companies which fall into one of these four verticals, we believe that our portfolio is strongly aligned with the positive decarbonising impact associated with these products and services.

UNIVERSE ALIGNMENT WITH THE SDGS

The 17 United Nations Sustainable Development Goals are backed up with 169 targets which act as a framework for “peace and prosperity for people and the planet, now and in the future”. They were adopted by all UN member states in 2015 as a blueprint for sustainable development to 2030. The SDGs have been widely adopted by the private sector as common language for communicating positive (and negative) impact.



We believe that there is strong alignment between our four sustainable energy subsectors and the following four SDGs:

- 7 AFFORDABLE AND CLEAN ENERGY** **Displacement** companies provide energy efficiency solutions and services (Targets 7.1, 7.3). **Generation** companies provide low-carbon energy, helping to increase the share of renewable energy in the global grid mix (Target 7.2).
- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE** **Installation** companies install, upgrade, and service low-carbon energy infrastructure, enabling greater adoption of clean technologies (Target 9.4).
- 11 SUSTAINABLE CITIES AND COMMUNITIES** **Electrification** companies enable the electrification of mobility, facilitating the transition towards sustainable transport systems (Target 11.2).
- 13 CLIMATE ACTION** Collectively, these companies provide the products, services, and solutions which allow governments to integrate climate change measures into national policies, strategies and planning (Target 13.2).

PORTFOLIO ALIGNMENT WITH THE SDGS

We have conducted an impact mapping exercise, matching up divisional business activity to relevant SDG targets to understand the impact our portfolio delivers beyond carbon displacement. Where a company's divisional activity contributes to more than one impact area, we assign the most relevant SDG/target as the division's “primary” impact and describe the overlapping / other impacts as “secondary” impact(s). We do not deliberately target these secondary impacts, yet the business activity of some of our portfolio companies also contributes towards the following SDGs:

- Target 3.9: Help reduce the number of deaths and illnesses from hazardous air pollution by enabling the electrification of transportation.
- Targets 8.4 & 11.6: Improve global resource efficiency and reduce the per capita impact of cities, through providing energy and water efficiency products and services.

- Target 12.5: Reduce waste by licensing efficient production processes and recycling batteries, helping to reduce waste generation.

The primary and secondary contributions of our investee companies are shown below:

Guinness Sustainable Energy strategy: SDG impact mapping

Company Name	3 GOOD HEALTH AND WELL-BEING	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION
Displacement							
Ameresco							
Hubbell							
Installed Building Products							
Nibe Industrier							
Trane Technologies							
Electrification							
Johnson Matthey							
LG Chem							
Samsung SDI							
Aptiv							
Gentherm							
Infineon							
Onsemi							
Sensata							
Generation							
China Longyuan							
China Suntien							
Iberdrola							
NextEra Energy							
Ormat							
Orsted							
Sunnova							
Installation (Equipment)							
Eaton							
Itron							
Legrand							
Schneider Electric							
Canadian Solar							
Enphase Energy							
First Solar							
SolarEdge							
Xinyi Solar							
TPI Composites							
Vestas							

Legend:
■ Primary impact >50% of business activity
■ Primary impact >10% - <50%
■ Primary impact >0% - <10%
■ Secondary impacts

Portfolio holdings as of 31st December 2023. Source: Guinness Global Investors

We are also aware that some of the business activity of companies in the portfolio detracts from the SDGs. When conducting due diligence, we attempt to consider both a company's positive and negative impact, seeking only to invest in companies which we view as having a net benefit on the energy transition. We detail some of these adverse impacts below.

Many of our displacement and installation names are manufacturing companies. Some of these companies are diversified with exposure to unfavourable end markets. For example, Eaton is a leading manufacturer of electrical equipment but also sells products such as actuators into aerospace and defence end markets. Within the electrification sector, we consider companies involved in the battery and electric vehicle supply chains. Many companies supplying components for electric vehicles also generate revenues from supplying parts for internal combustion engine vehicles.

We consider both utilities and independent power producers (IPPs) within our generation names. Many of these still own legacy fossil fuel generation assets, contributing towards increased global carbon emissions and exacerbating the climate crisis.

On average, our utility and IPP holdings have around 19% of their business activities exposed to fossil fuel generation and distribution. We will own these companies on the condition that a sizeable proportion of their business is already dedicated to renewable generation and a clear commitment has been made towards growing this further while phasing out fossil fuels.

CASE STUDY: CHINA LONGYUAN POWER GROUP

China Longyuan Power Group ("Longyuan") is China's largest wind farm operator with over 27GW of installed wind capacity. In 2023, it reported 73% of sales from wind power with an additional 4% from solar PV power. Combined, these two divisions are responsible for around 95% of operating income and assets. However, the company also generated 11% of sales from coal power generation, which contributes to global warming.

Despite this, we believe Longyuan deserves a place in our portfolio for three main reasons:

- **It has grown its wind power business significantly while keeping its coal capacity flat:** The company has grown its consolidated installed wind capacity more than tenfold over the past 15 years from 2,500MW in 2006 to over 27,000MW in 2023. Over the same period, coal capacity has remained constant at 1,875MW.
- **The company is far less carbon-intensive than its peers:** According to MSCI, the company has a carbon intensity around 60% below the industry average. What's more, the company's carbon intensity per kilowatt hour of electricity sold has fallen by around 30% over the last five years alone.
- **The company plans to become fossil fuel free in 2025:** In 2021, the company committed to disposing of its coal plants by January 2025. In August 2024, the company made progress on this commitment by announcing the disposal of an equity interest in its Jiangyin Sulong thermal generation asset. We expect more disposals to come, ultimately resulting in the company being fossil fuel free and generating 100% of its revenues from renewable energy in the next 6-12 months.

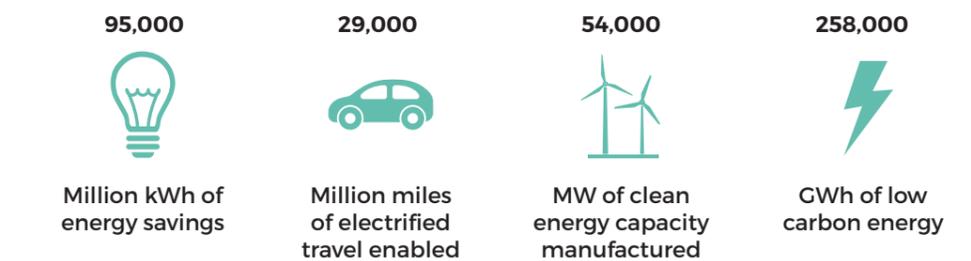
Despite some of our companies having negative impacts, we believe that the companies owned in the Guinness Sustainable Energy strategy deliver a net positive impact. Where companies derive less than 50% of sales, profits or cash flow from sustainable energy, we would look for substantially more than 50% of investment to be going into sustainable energy, meaning that the driver of future growth (and typically therefore the driver of equity value) over the coming years comes from sustainable energy.

IMPACT OF COMPANIES IN THE GUINNESS SUSTAINABLE ENERGY PORTFOLIO

AGGREGATE ENTERPRISE LEVEL IMPACT FIGURES

In this report, we present the positive impact associated with our investee companies by estimating the carbon dioxide emissions displaced and generated through use of their products and services. Please note that these are unaudited figures, which rely on internal estimates.

For 2023, we estimate that in aggregate, the companies in our portfolio achieved all of the following:



Data for portfolio holdings as of 31st December 2023. Source: EPA, Guinness Global Investors



ANNUALISED CARBON DISPLACED PER \$1M OF PORTFOLIO ASSETS

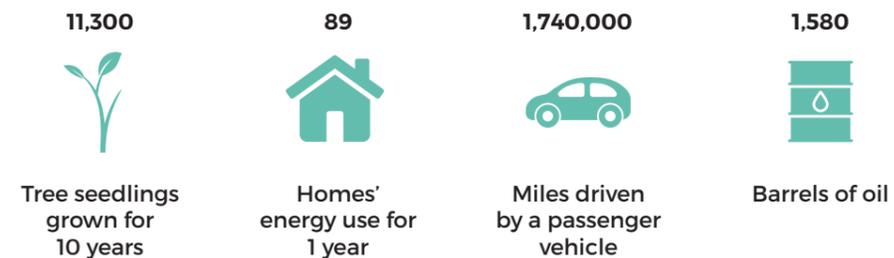
In 2023, we estimate that:

- The annualised carbon cost (Scope 1+2 emissions) associated with our portfolio was 54 tCO₂e/\$m portfolio assets
- The annualised carbon displaced (Scope 4 emissions) associated with our portfolio was 682 tCO₂e/\$m portfolio assets.



Data for portfolio holdings as of 31st December 2023. Source: Guinness Global Investors

According to the Environmental Protection Agency (EPA), 682 tonnes of CO₂ is equivalent to one of the following:



Source: EPA, Guinness Global Investors

We find it interesting to look behind our headline finding of 678 tCO₂e displaced / \$1m of portfolio assets to understand what makes up this figure. Similar to last year, the installation subsector was the largest contributor, accounting for 49% of carbon displaced. Within the installation sector, Canadian Solar was a significant contributor. Canadian Solar is a leading solar photovoltaic module brand, provider of solar energy and battery storage solutions and developer of utility-scale solar power and battery storage projects. Global electricals giant Schneider Electric was also a large contributor alongside Xinyi Solar, the world's largest manufacturer of solar glass.

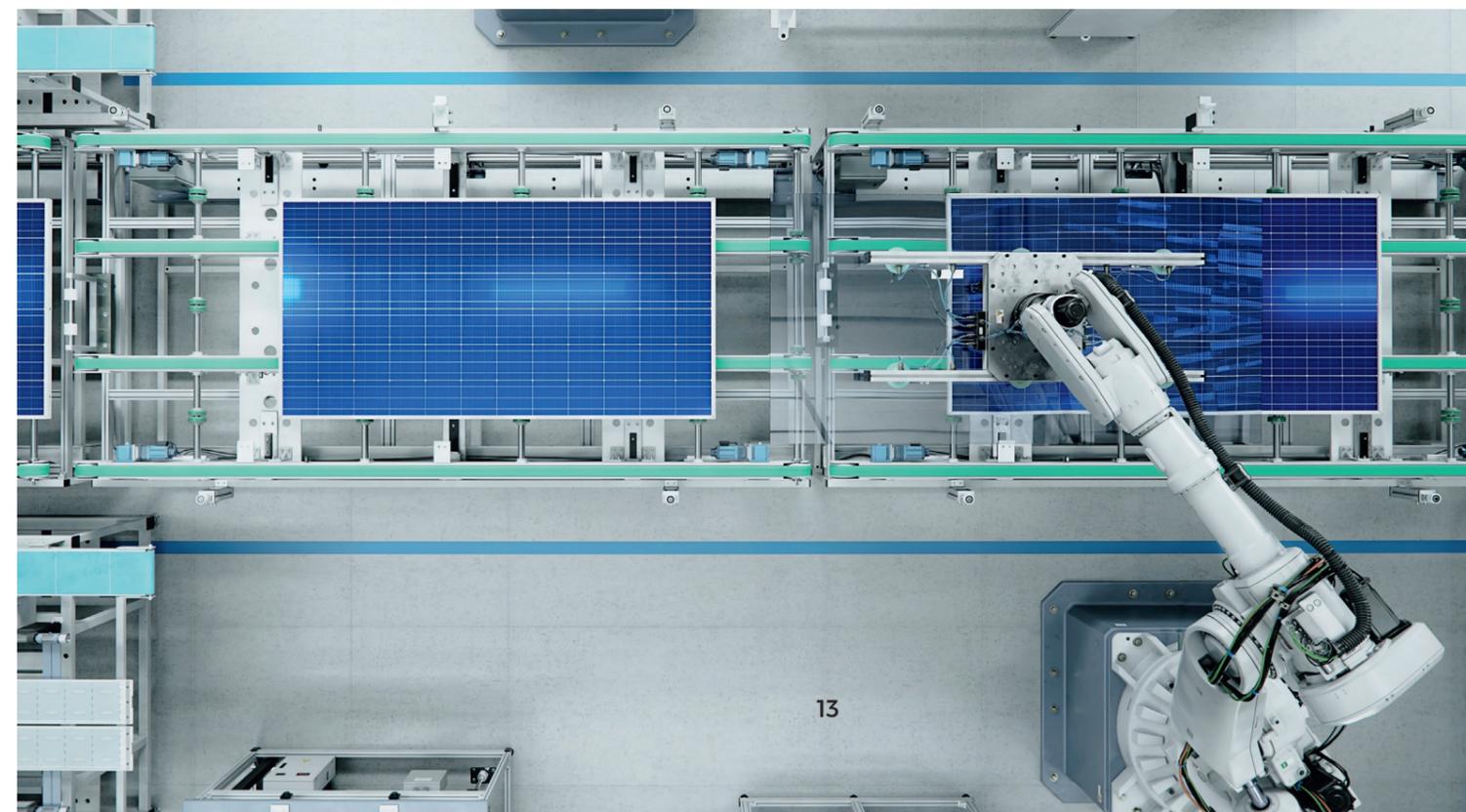
As Xinyi is fairly energy-intensive, and glass manufacturing is still reliant on coal power generation, the company has relatively high Scope 1 and 2 emissions. We expect this to improve over time as China decarbonises its electricity grid.

Within the generation group, our two Chinese wind names (China Suntien and China Longyuan) once again achieved some of the highest displacement per dollar of investment, compared to European and North American generation exposure in the portfolio. This is not particularly surprising given the relatively low valuations of the Chinese names relative to the scale of their generation assets.

The electrification sector makes up only 4% of the CO₂e displaced. In our calculation of an EV component company's positive impact, we estimate the number of electric miles it has enabled and then apply a scaling factor based on the product's contribution to the cost of a mid-range electric vehicle. Despite playing vital roles in electric drivetrains, components such as Sensata's EV sensors and electrical protection are typically responsible for less than 3% of the overall cost of an electric vehicle. For a number of our EV names, this results in a relatively low positive impact contribution, although we expect this sector to make some of the biggest gains in positive impact over the next few years. We discuss scaling factors further in our worked example later in this report.

We note that our headline figure of 682 tCO₂e displaced / \$1m of portfolio assets is higher than last year. The main driver behind this was the year-on-year increase in positive impact activity, followed by changes in valuation and market capitalization. Stripping out changes in market capitalization, the aggregate positive impact of companies owned in the portfolio at the end of 2023 increased by +16% year-on-year. Other factors which had less of an effect included updates and revisions to assumptions, methodologies and product lives, and changes in portfolio holdings.

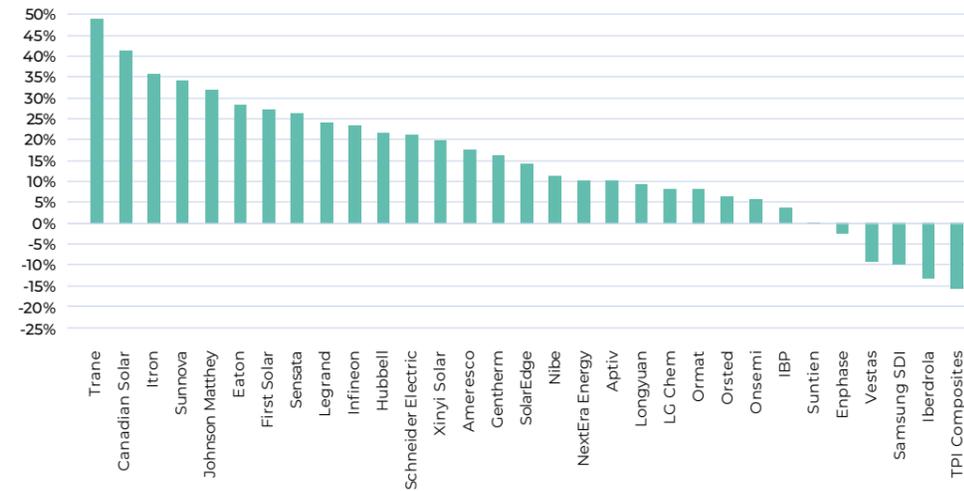
Our calculations described here incorporate Scope 1 (direct emissions from owned or controlled sources), Scope 2 (indirect emissions from the purchased electricity, steam, and heat purchases) and the estimated 'Scope 4' emissions – those displaced through the use of the products and services a company delivers. We also include some initial analysis of the portfolio's available Scope 3 data (all other indirect emissions that occur in a company's value chain).



CHANGE IN IMPACT VERSUS 2022

We use our own process of measuring and disclosing investee company impact as a way to identify companies to prioritise for engagement.

Percentage change in estimated annualised CO2 displaced by company, 2023 vs 2022. Aggregate portfolio improvement excluding market cap changes = +16%



Data for portfolio holdings as of 31st December 2023. Source: Guinness Global Investors

Assuming we owned 100% of each company in our portfolio, the aggregate improvement in gross carbon emissions displaced increased by +16% year-on-year. Some of the companies which saw the biggest increases in positive impact were Trane Technologies, Canadian Solar, Itron, and Sunnova.

- **Trane Technologies** saw its estimated CO2 displaced increase by nearly 50%.
 - This was driven by a 16% increase in sales of heating, ventilation, and air conditioning solutions, with a higher contribution from low-carbon products.
 - The company estimates that its products have helped customers avoid 157 million tCO2e from 2019 to 2023.
- **Canadian Solar's** positive impact grew by 41%.
 - The company's solar module shipments increased by 45% year-on-year from 21.1GW in 2022 to 30.7GW in 2023.
 - This growth was slightly offset by a reduction in scaling factor as module prices fell faster than the levelized cost of solar electricity.
- **Itron's** estimated Scope 4 emissions increased by 36%.
 - Company sales increased by over 20% in 2023 with higher mix from customers who provide predominantly energy-related services.
 - Last year, Itron estimates that its metering solutions enabled customers to avoid at least 6.8 million metric tons of greenhouse gas emissions.

- **Sunnova's** estimated carbon avoided increased by over 30%.
 - This was driven by a 33% increase in installations, bringing the company's cumulative residential solar capacity to 2,292MW.
 - Sunnova estimates that the capacity deployed in 2023 generated 2.5 billion kilowatt hours of clean energy, helping to save 1.8 million tonnes of carbon emissions.

This year we identified seven companies which saw their positive impact fall year-on-year: TPI Composites, Iberdrola, Samsung SDI, Vestas, Enphase, and China Suntien.

Vestas reported a 3% decline in its positive impact in 2023 driven by lower turbine shipments amid a challenging wind environment. TPI Composites, an outsourced wind blade manufacturer and one of Vestas' suppliers, saw a drop in emissions avoided for similar reasons. Iberdrola's Scope 4 emissions fell by 13% in 2023 versus 2022 as a 6% increase in renewable power generation was more than offset by a 35% lower contribution from energy efficiency products in its commercial division. Despite a 29% increase in EV battery sales, a decrease in estimated Scope 4 emissions from Samsung SDI's utility-scale batteries led to an overall decline of 10% in the company's positive impact. Enphase saw a 2% decline in emissions avoided as a slowdown in residential solar following regulatory changes in California dragged on sales. China Suntien reported a small drop in its avoided emissions in 2023 compared to 2022. We believe that that company's small increase in wind electricity sales was outweighed by a larger decrease in the carbon intensity assumed for China's grid as renewables continue to take share from coal.

In all cases, the observed decline in positive impact was due to temporary fluctuations, calculation changes, or one-offs rather than any deviation in corporate strategy. Overall, we are happy that our holdings are well aligned to deliver a positive environmental impact by growing revenues and profits from climate solutions. We will continue to monitor their progress in future reports.



METHODOLOGY

Data collection

We gather relevant operational and environmental metrics for all portfolio companies where data is available or can be reasonably estimated. Please see Appendix 1 for details on the type of data we use.

Calculation of company impact

We apply reasonable assumptions to translate the data into an estimate for annualised CO2e displaced (positive impact) in the current year. This is increasingly being described in the industry as Scope 4 (S4) emissions. Afterwards, we apply a scaling factor to revise our impact estimates downwards to reflect the product's contribution to the final impactful product cost.

CASE STUDY: VESTAS SCALING FACTOR

Vestas is a leading wind turbine manufacturer. Without clean energy technologies like wind power, additional fossil fuel capacity would be required to generate electricity, resulting in increased carbon emissions.

However, on their own, wind turbines cannot generate clean energy; other hardware and soft-costs are required. Therefore, it would not be fair to award Vestas with 100% of the emissions displaced thanks to the clean energy generated by its turbines. We therefore apply a scaling factor.

According to the National Renewable Energy Laboratory's Cost of Wind Energy Review, turbine capex (rotor, nacelle, tower) makes up 41% of the levelized cost of electricity (LCOE) for onshore wind. The remaining 59% is split across operational expenditure (26%); balance of system capex (22%) including the foundation, associated electrical infrastructure, and transportation and installation; and soft costs (11%) such as construction finance and warranty. For Vestas, 41% is our scaling factor.

Annualising

The S1+S2 emissions of a wind turbine manufacturer represent the upfront carbon cost which has to be recognised in order to enable 20 years of carbon displacement through wind energy generation. One way of measuring impact would be to subtract the S1+S2 emissions from the emissions displaced by the wind turbines over its operational life of 20-25 years. However, when measuring impact across a number of technologies, we believe it is better to present this data on an annualised basis. We divide both the carbon emitted to create the product (S1+S2 emissions) and the estimated lifetime carbon displaced (S4 emissions) by the product's estimated useful product life. This provides an estimate for annualised carbon cost (S1+S2 / product life) and an annualised carbon displaced (S4 / product life).

Calculating impact per \$1m of portfolio assets

A holding of \$1m in an equally weighted portfolio of 30 stocks would result in an indicative \$33,333 holding in each company. We divide that holding by the company's market capitalization to get a percentage share of ownership. We can then multiply this by the annual carbon displaced (positive impact) and annual carbon cost (negative impact) estimates to present an estimate for the investor's owned positive and negative impact per \$1m of portfolio assets. This is then aggregated across all our portfolio holdings in order for us to present a figure for owned carbon displaced and owned carbon cost per \$1m of portfolio assets.

WORKED EXAMPLE: VESTAS

Positive Impact (estimated carbon displaced)

Data collection:

In 2023, Vestas produced and shipped 11.7 GW of turbines. In its 2023 Sustainability Report, the company estimates that these turbines are expected to avoid 396 million tonnes of CO2e over their lifetime in operation.

Calculation of company impact:

To estimate the annual emissions displaced in 2023, we start with Vestas' estimate for lifetime emissions avoided by their products (396m tCO2e). As discussed earlier, wind turbines represent approximately 41% of the LCOE for onshore wind. If we apply a 41% scaling factor to Vestas' Scope 4 estimate, we reach a 'scaled down' estimate for lifetime carbon displaced of c.162m tCO2e.

Negative Impact (estimated carbon emissions generated)

Data collection:

In 2023, Vestas disclosed Scope 1+2 emissions of 109,000 tCO2e, suggesting that 0.109m tCO2e was emitted in order to produce and ship 11.7GW of turbines in the year.

Annualising

We divide the scaled down estimate for lifetime carbon displaced (162m tCO2e) by the average expected life of the turbines produced and shipped in 2023 (23.7 years) to derive an estimate for annualised carbon displaced (8.1m tCO2e).

Similarly, the upfront carbon cost (S1+S2) which has been recognised to enable 23.7 years of wind generation is 0.109m tCO2e. Annualizing this figure results in a comparable negative impact figure of 0.005m tCO2e per year.

Impact per \$1m of portfolio assets

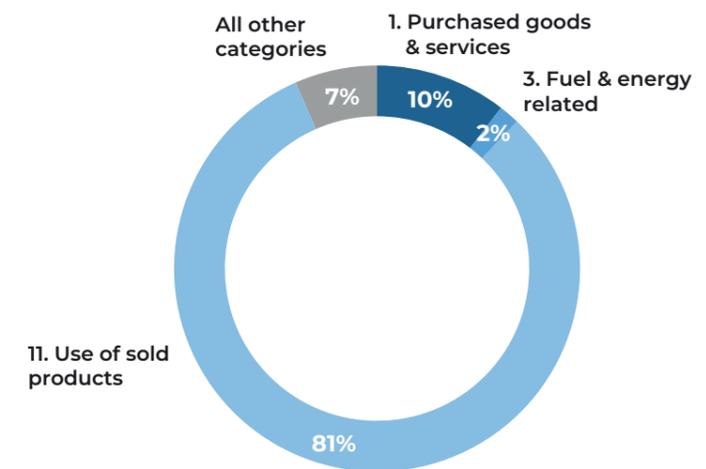
\$33,333 invested in Vestas (\$32.1bn market capitalization as of 31st December 2023) leads to a 0.0001% ownership stake. If we multiply this stake by the annualised company level positive (8.1m tCO2e) and negative (0.005m tCO2e) impact estimates, we reach an annualised carbon displaced (positive impact) figure of 8.4 tCO2e and an annualised carbon cost (negative impact) figure of 0.01 tCO2e generated.

SCOPE 3 EMISSIONS

Last year, we found that just three GHG Protocol categories made up 97% of our portfolio's Scope 3 emissions: 83% Category 11 (Use of products sold), 11% Category 1 (Purchased goods & services), 4% Category 3 (Fuel & energy related). After collecting the available data from CDP and company disclosures for 2023, we found that once again these three categories dominated the portfolio's Scope 3 emissions: 81% Category 11, 10% Category 1, 2% Category 3.

In 2023, the contribution of these categories has remained largely similar to last year.

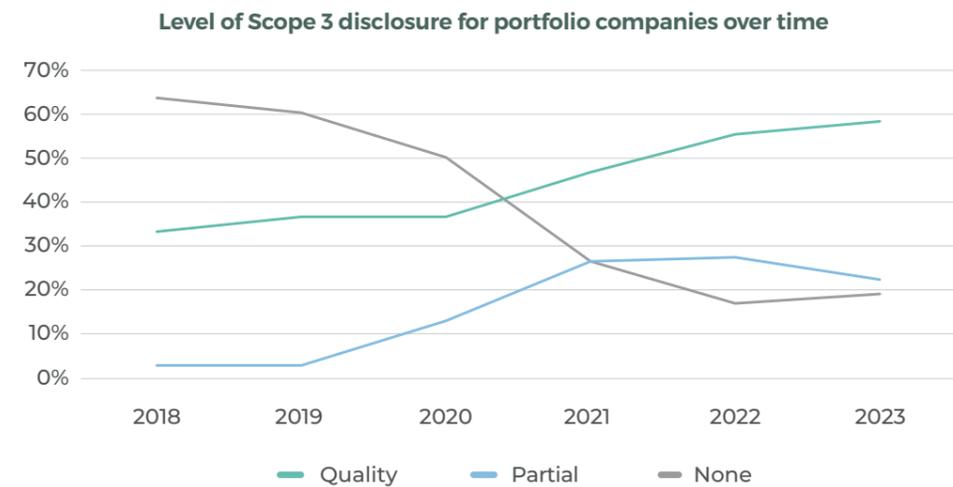
Scope 3 emissions breakdown by category



Data for portfolio holdings as of 31st December 2023. Source: Company reports, CDP, Guinness Global Investors

Scope 3 reporting is still developing, with many companies not reporting any information at all or producing partial disclosures covering one or two of the 15 categories (typically business travel and employee commuting) but not all of them. At present:

- 58% of portfolio companies report high-quality Scope 3 data;
- 23% of portfolio companies report partial Scope 3 data; and
- 19% of portfolio companies do not report any Scope 3 data.



Data to 31st December 2023. Source: Company reports, CDP, Guinness Global Investors

Disclosure is slowly improving, but incomplete data makes quantitative Scope 3 analysis difficult at present. The quality of this data is also questionable:

- Some categories were relevant but not yet calculated;
- Different companies may use different methodologies for similar categories;
- Different companies rely to different extents on supply chain partner data;
- There can be significant swings in calculations from year to year; and
- Third party estimates can vary materially.

We have conducted some initial analysis, incorporating Scope 3 data into our carbon cost calculations. Since many of the companies we own operate within the same industries and are often customers or suppliers to one another, there is likely to be a degree of double counting of upstream and downstream emissions. As a result, we do not currently have enough confidence in the Scope 3 data to publish these results. Having said this, we were encouraged to find that our estimated emissions avoided greatly outweighed the carbon cost even when it included Scope 3 emissions.

Our ambition is to continue to improve our Scope 3 reporting and analysis as disclosure improves.

ENGAGEMENT BY THE GUINNESS SUSTAINABLE ENERGY TEAM

As a public equities investment house with \$9.8bn in assets under management, we recognise that our engagement 'clout' is likely to be limited compared, say, to that of a private equity firm which takes majority stakes in its investee companies. However, we believe that successful long-term engagement shares parallels with Richard Thaler's nudge theory, the idea that behaviour and decision making can be influenced through positive reinforcement and suggestions for improvement. We are but one actor trying to nudge companies in the right direction. However, when multiple actors, either independently or collectively, nudge in the same direction of positive change, it is far harder for companies, industries and governments to ignore.

ENGAGEMENT FRAMEWORK

In our engagement efforts, we seek to ensure that the strategies of our portfolio companies are aligned with delivering the low-carbon transition. The desired outcomes of our engagement are to grow our companies' positive impacts, reduce their negative impacts and shrink their operational emissions. Taking inspiration from Climate Action 100+, our engagement framework revolves around 3 key pillars:

- **Disclosure:** Once a risk is measured, it can be managed through target setting.
- **Target setting:** Once a target has been set, it can be incentivised through remuneration.
- **Incentivisation:** Once a target is incentivised, it is more likely to be achieved.

We engage both directly and collectively with participants across the energy spectrum.

When we engage on **disclosure**, we commonly ask companies to produce an ESG report, measure and disclose Scope 1 and 2 emissions, complete the CDP climate survey, produce TCFD aligned disclosures, measure and disclose Scope 3 emissions, disclose green product revenues, or measure and disclose estimates for carbon emissions avoided thanks to customers using their products.

When we engage on **target setting**, we often ask companies to set operational emissions reduction targets, set renewable energy targets, set net zero targets, register carbon reduction targets with the Science Based Targets initiative (SBTi), set Scope 3 targets, set green product sales targets, or set targets to phase out fossil fuels from their generation mix.

When we engage on **incentivisation**, we might ask companies to ensure there is board level oversight of climate issues, disclose which metrics are used in management pay, allow shareholders to vote on the frequency of say on pay votes, consider incorporating ESG metrics in their remuneration plans, consider switching away from undesirable structures and metrics (TSR) and towards pro-climate metrics: sustainable profitability (return on capital), growing positive impact (green sales / reducing customer CO2 emissions), reducing negative impact (phasing out fossil fuel generation), or reducing operational emissions (CO2 emissions reduction).

We track each company's progress against these indicators in our proprietary engagement matrix. While it is almost impossible for individual investors to claim direct responsibility for engagement successes, we provide some examples overleaf where we believe we have contributed to changing company behaviour for the better.

Proportion of portfolio companies with CDP climate responses, SBTi emissions reduction targets, and pay linked to pro-climate metrics



Source: CDP, SBTi, Glass Lewis, Company reports, Guinness Global Investors.
Based on portfolio data to 31st December 2023.

This chart shows an extract from our engagement matrix, showing a steady increase in portfolio companies completing the CDP climate survey, setting science-based climate targets with the Science Based Targets initiative (SBTi) and linking pay to pro-climate metrics over time.

ESCALATION

We often engage and interact with our companies via email, calls and face-to-face meetings. These interactions typically start with a member of investor relations or the management team. Where we have highlighted an issue which we do not think has been given sufficient attention or consideration, we reserve the right to escalate the engagement through meeting with more senior members of management, voting against directors and writing directly to members of the board. Ultimately, if the issue remains unresolved after repeated engagement attempts, we reserve the right to divest.

CASE STUDY: DISCLOSURE

China Suntien Green Energy (“Suntien”) is a major wind power producer in Northern China. When we first reviewed Suntien’s ESG credentials in April 2021, we noted that the company had not yet completed the CDP Climate Change questionnaire.

In August 2021, we wrote to company representatives, asking if the company would consider disclosing its carbon emissions to CDP. In June 2022, following the publication of the company’s 2021 ESG report, we wrote to the company again, reiterating our request, but no further progress was communicated. In the same month, we joined CDP’s annual Non-Disclosure Campaign (NDC) for the first time, a collaborative initiative urging companies to disclose data through CDP.

In February 2023, we set up a meeting with company management to once again encourage the company to disclose its emissions to CDP, noting that several of Suntien’s clean energy peers in China had already made initial submissions. In the following month, we submitted a request to lead the CDP’s Non-Disclosure Campaign engagement with Suntien and were awarded the lead engagement role for the company in June that year.

Once more, Guinness wrote a letter to Suntien, signed by our CEO and supported by other financial institutions, urging the company to make a first attempt at the questionnaire in 2023 and stressing the importance of CDP reporting to investors. The company replied, informing us that they were in the process of completing their CDP submission and shortly after we were pleased to see the company’s first disclosures published on CDP’s website.

CASE STUDY: TARGET SETTING

Infineon is a global leader in automotive power semiconductors. In March 2021, our in-depth sustainability assessment of the company identified the company as an ESG leader, noting ambitious targets to cut scope 1+2 emissions by 70% by 2025 and become carbon neutral by 2030. Despite this, we noted that the company’s emissions targets were not science-based.

In June 2022, we wrote to the company, encouraging it to register its 2025 carbon reduction target with the Science Based Targets initiative (SBTi), following up with a call in August 2022. On the call, company representatives explained that scope 3 emissions make up over 40% of Infineon’s overall emissions, meaning that the SBTi required a target to reduce these emissions too for the company’s climate targets to qualify. At the time, the company told us that they had concerns with the reliability of scope 3 data due to the relatively nascent nature of its reporting and reliance on third-party estimates.

We spoke with the company again in May 2023, asking for further detail around roadblocks to setting a scope 3 target. The company reiterated its commitment to accurate data to avoid accusations of greenwashing, outlining how improving supplier disclosures were helping to improve data quality. In October 2023, Guinness co-signed letters to over 2,000 companies including Infineon alongside 300 other financial institutions managing \$32tn in assets, encouraging them to set science-based climate targets as part of CDP’s Science-Based Targets campaign.

In December 2023, Infineon gained sufficient confidence in its upstream and downstream emissions data to set itself even more ambitious climate targets by including scope 3 emissions. We were also pleased to see Infineon commit to setting a science-based target in the next two years.

CASE STUDY: INCENTIVISATION

Itron is a leading global provider of advanced metering infrastructure and software used by utilities to optimise the delivery and use of electricity and gas for end customers. In our review in 2021, we noted that disclosures were improving and that the company was planning to set new emissions reduction targets in 2022.

In June 2022 the company committed to achieving a 50% reduction in S1+2 emissions by 2028, carbon neutrality by 2035, and net zero by 2050 or sooner. In the same month, we arranged a call to congratulate management on these comprehensive targets and asked whether they had considered incorporating them into executive remuneration. We were told that this had been discussed, but that the board believed a focus on revenue, profitability and cashflow was more important in the near term.

In December 2022, we held a meeting with members of the board to discuss the company’s climate governance and incentivization further. We asked the Chair of the Remuneration Committee and the Chair of the Board directly whether they would consider linking Itron’s climate commitments to CEO pay. Once again, they told us that their current focus was on profitability and cashflow. Understanding that the business was in a cyclical trough, we accepted the near-term prioritization of financial metrics and came away feeling that the board had heard our requests and would seek to incorporate ESG metrics into executive compensation once profitability had improved.

In March 2024, after five consecutive quarters of profit margin improvement, Itron released its 2024 proxy statement, updating its long-term incentive plan to include a 10% link to the company’s GHG reduction targets.

CASE STUDY: UK CLIMATE POLICY ENGAGEMENT

Guinness Global investors joined the UK Sustainable Investment and Finance association in 2021. The organization brings together over 300 members managing over £19 trillion in assets to build a strong and connected sustainable finance community in the UK, influence government and regulators, and facilitate knowledge sharing of issues and solutions.

The UK has been a global decarbonisation leader, setting ambitious targets to install 50GW of offshore wind capacity by 2030 and achieve a fully decarbonised electricity system by 2035. However, 2023 saw the UK water down a number of its climate commitments by delaying a 2030 ban on the sale of new petrol and diesel cars, loosening a 2035 phaseout of gas boiler sales and reducing the cost of carbon for high polluting industries such as steel.

In August 2023, we co-signed a letter to Prime Minister Rishi Sunak alongside 36 other UKSIF members, urging the government to provide greater certainty over long-term climate policy. In September 2023 we followed up by participating in a UKSIF advisory round table, discussing how the UK government could attract more private capital to help decarbonise the energy sector over the next 5-10 years.

The outcome from this discussion was UKSIF's energy policy research paper, published in February 2024, which recommended 1) overhauling planning rules to accelerate clean energy installations 2) ensuring adequate grid capacity to reduce connection delays, and 3) reforming energy pricing mechanisms (e.g. contracts for difference).

In July 2024, Sir Keir Starmer led the Labour party to a general election victory with planning reform in his vision for growing the UK economy. Steps by the new government strongly align with UKSIF's recommendations in 1) changing planning rules to lift the de facto ban on onshore wind farms 2) committing to tackling lengthy delays for grid connections, and 3) announcing a jump in the budget for the next contracts for difference allocation round from £1.0bn to £1.5bn.

Through our membership with UKSIF, we are able to contribute to these discussions, playing a role in influencing domestic climate policy.

CLIMATE-RELATED INITIATIVES

Below, we list the climate-related investor initiatives that Guinness Global Investors is involved with:

CLIMATE ACTION 100+



Climate Action 100+ is the largest investor engagement initiative on climate change, encouraging the largest corporate greenhouse gas emitters to take necessary action on climate change. The Climate Action 100+ Net Zero Company Benchmark assesses the performance of focus companies against the initiative's three high-level goals: disclosure, emissions reduction and governance.

CDP'S NON-DISCLOSURE CAMPAIGN



The CDP is an international non-profit organisation that helps companies disclose their environmental impact. The CDP's Non-Disclosure Campaign (NDC) is a collaborative initiative engaging with companies to encourage them to submit their environmental disclosures to CDP. The CDP's Science Based Targets campaign is one of the largest collective investor engagement campaigns in the world, urging global companies to set science-based climate targets through the Science Based Targets initiative.

INVESTOR AGENDA - GLOBAL INVESTOR STATEMENT



The Investor Agenda is made up of seven major groups (AIGCC, CDP, Ceres, IGCC, IIGCC, PRI and UNEP FI) working with investors to pull together the best guidance on tackling the climate crisis. The Investor Agenda's Global Investor Statement outlines key climate policies and urges governments to radically step up their climate ambitions.

WORLD BENCHMARKING ALLIANCE - INVESTOR LETTER AND INVESTOR STATEMENT



In 2022, the World Benchmarking Alliance (WBA), Ninety One and Newton, in coordination with Climate Action 100+ sent a letter on just transition to 100 oil and gas companies, calling for them to engage with relevant stakeholders and publish disclosures regarding their just transition planning. In 2023, the WBA followed up by sending an Investor Statement on the Just Transition to all 100 oil and gas companies. The statement is intended to be a signal to companies directly and other actors of influence of the importance investors are putting on the just transition.

UK SUSTAINABLE INVESTMENT AND FINANCE ASSOCIATION



UKSIF is the membership association for sustainable and responsible financial services in the UK. Through policy engagement, knowledge sharing and networking, it seeks to achieve its mission of promoting sustainable finance and making the UK the 'world's first net-zero financial centre'. They have a 30-year track record of successfully influencing government policy, championing the role of sustainable finance as a tool to help decarbonise the economy and advance a sustainable future.

APPENDIX 1: IMPACT ALIGNMENT

HISTORY OF IMPACT

Impact investing traces its roots back to Socially Responsible Investing, the practice of avoiding “sin” stocks through screening out companies based on the impact of a company’s products. In the 1960s, the Ford Foundation created program-related investing (PRIs), shifting away from using grants and towards making low-interest loans to finance programs like urban redevelopment or affordable housing. PRI established the practice of positively screening for investments based on the perceived societal impact of a company’s products whilst delivering a return of capital. In 2007, the Rockefeller foundation coined the term “impact investing”, defining it as an activity which seeks to generate social and/or environmental benefits while delivering a financial return. They stated that two key elements should be present, intentionality and measurement. To date, impact investment has typically involved private market-based project financing. As it has matured, it has started to migrate into public markets, accessing deeper pockets of capital.

IMPACT INVESTING IN PUBLIC MARKETS

The discussion of whether a public equities strategy can be designated as impactful is fraught with controversy, often centring on the concept of additionality: the extent to which desired outcomes would have occurred without the investor’s intervention. Opponents say that ‘true’ impact investing can only occur in primary markets, where the measured positive externality would not have occurred without the new and additive financial resource. Proponents say that ownership matters: additionality can be achieved through engaging with companies and policy makers to raise standards.

We have sympathy for both views. The investor’s contribution towards the impact may be less intense in secondary markets and delivered primarily through engagement rather than through new capital. But just because the form of additionality is different, does not necessarily mean it should be dismissed. As a fractional owner of a company, it is nearly impossible to draw a causal link between engaging with a company and behavioural change. However, if a mindful investor contributes to a broader trend or group engagement for positive change, it becomes far harder for management, industries and policymakers to ignore.

IMPACT ALIGNMENT

The Guinness Sustainable Energy strategy intentionally screens for companies selling the products and services which will help to deliver the transition towards a low-carbon economy. When companies and consumers purchase and use these solutions (heat pumps, electric vehicles, renewable energy) over incumbent technologies (gas boilers, internal combustion engines, fossil fuel generation) they contribute towards the global effort to reduce greenhouse gas emissions and combat climate change.

By investing in the companies that produce these products and services, we believe that the strategy’s success is closely aligned with this positive environmental impact. This alignment flows through our universe construction, where we deliberately target companies delivering climate solutions; through our reporting, where we measure and report on the carbon avoided and carbon cost of our portfolio; and through our engagement, where the overwhelming focus is on climate action.

APPENDIX 2: SDG MAPPING METHODOLOGY

Where companies have positive exposure to more than one target or goal, we assign the company’s revenues first to the goal which we believe is most relevant to them. We describe this as the company’s “primary impact”, which on our schematic is represented in a green colour. We grade the level of primary impact by the proportion that the relevant activity comprises of the company’s overall business activity. We then record other, or ‘secondary’ areas of positive impact, represented by a light blue colour.

CASE STUDY: VESTAS

Primary impact

We believe that Vestas’ wind turbines help to deliver SDG target 7.2: “By 2030, increase substantially the share of renewable energy in the global energy mix”. In 2023, 77% of its revenues came from wind turbine manufacturing, so we assign 77% of business activity to SDG 7. We believe that this goal and target are most relevant to the division’s activity, so it is designated as a primary impact.

Secondary impact

We believe that products and services which upgrade and decarbonise energy infrastructure also align with SDG target 9.4: “By 2030, upgrade infrastructure and retrofit industries to make them sustainable...”. We consider this to be secondary in relevance to SDG 7, so it is designated as a secondary impact for Vestas.

SDG 13: CLIMATE ACTION

Our mapping work produces the outcome of no primary exposure to SDG 13, ‘Climate Action’, which appears out of place for a sustainable energy strategy. This is because we map business activity to the underlying targets, and the targets for SDG 13 appear to be more aimed at governments, rather than private sector companies. As we believe that all the companies in our universe will contribute “to limit[ing] global temperature rise to well below 2 degrees centigrade”, we recognise their contribution as a secondary impact only.

APPENDIX 3: BUSINESS ACTIVITY MAPPING

SDG	TARGET	RELEVANT BUSINESS ACTIVITIES	COMPANIES
3. GOOD HEALTH & WELL-BEING	3.4. By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.	Manufacturing diabetes drugs, generic active ingredients (e.g. for opioid addiction therapy)	LG Chem, Johnson Matthey
	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents.	Manufacturing systems and components which contribute towards autonomous mobility and advanced safety, such as driver assist, sensors, semiconductors, electronics and software.	Aptiv, Onsemi, Infineon, Sensata
	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	Companies playing an active role in the supply chain for cleaner transport (EVs, e-bikes, e-buses, FCEVs) including: batteries and cathode material, thermal management, components for hybrids (e.g. 12V, 48V) and fuel cells, auto-catalysts, electronics for EVs, lightweight materials for e-buses.	Johnson Matthey, LG Chem, Samsung SDI, Aptiv, Gentherm, Onsemi, Infineon, Sensata, Eaton, SolarEdge, TPI Composites
7. AFFORDABLE & CLEAN ENERGY	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	Involved in the construction, installation, operation and maintenance of hydro, wind, solar, geothermal and biomass energy, including supply chain contributors, companies which provide grid connection equipment, electricity distribution, smart meters and ESS.	Ameresco, Hubbell, Johnson Matthey, LG Chem, Samsung SDI, Infineon, Itron, Schneider, Eaton, Canadian Solar, Enphase, First Solar, SolarEdge, Xinyi, Vestas, Iberdrola, Ormat, TPI Composites
	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	Companies involved in hydro, wind, solar, geothermal, biomass generation, ESS, energy networks, or other renewable energy technology and their respective supply chains.	Ameresco, Hubbell, Nibe, LG Chem, Samsung SDI, Infineon, Itron, Schneider, Eaton, Canadian Solar, Enphase, First Solar, SolarEdge, Xinyi, TPI Composites, Vestas, China Longyuan, China Suntien, Iberdrola, NextEra, Ormat, Sunnova, Johnson Matthey, Legrand
	7.3 By 2030, double the global rate of improvement in energy efficiency	Companies involved in selling energy efficiency products and services such as insulation, LEDs, heat pumps, ESS, smart meters or energy management.	Ameresco, Hubbell, Nibe, LG Chem, Samsung SDI, Johnson Matthey, Infineon, Itron, Schneider, Eaton, Enphase, SolarEdge, Ormat, Trane Technologies, Onsemi, Legrand, Installed Building Products
	7.8 By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	Businesses with significant business activity outside of developed markets (North America, W. Europe, Australia, Japan, S. Korea), or businesses with a significant presence on island territories which deliver hydro, wind, solar, geothermal and biomass energy, including supply chain contributors, smart grid services, and grid storage	Xinyi, China Longyuan, China Suntien, Ormat

SDG	TARGET	RELEVANT BUSINESS ACTIVITIES	COMPANIES
8. DECENT WORK & ECONOMIC GROWTH	8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead	Licencing technology / processes to industry which enable greater resource efficiency, lower emissions and less waste, energy efficiency projects and equipment, resource measurement and management (meters), recycling, repair and maintenance, projects to improve energy and resource efficiency of industry.	Ameresco, Hubbell, Nibe, Johnson Matthey, Itron, Schneider, Eaton, Trane Technologies, Infineon, Legrand, Installed Building Products
9. INDUSTRY, INNOVATION & INFRASTRUCTURE	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	Upgrading, maintaining, and operating the grid to enable greater uptake of renewable energy, energy efficiency projects and equipment, resource measurement and measurement, recycling, manufacturing clean energy infrastructure such as wind turbines and solar farms along with their respective supply chains.	Ameresco, Hubbell, Nibe, Johnson Matthey, Itron, Schneider, Eaton, Canadian Solar, Enphase, First Solar, SolarEdge, Xinyi, TPI Composites, Vestas, China Longyuan, China Suntien, Iberdrola, Nextera, Ormat, Trane Technologies, Infineon, Sunnova, Legrand, Installed Building Products
11. SUSTAINABLE CITIES & COMMUNITIES	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	Electric transportation / batteries for electrified transport and their supply chains, electrical systems and semiconductors which support electrification of transport, battery thermal management, hybrid systems, light weight composite materials for electric buses.	Johnson Matthey, LG Chem, Samsung SDI, Aptiv, Gentherm, Onsemi, Infineon, Sensata, Eaton, SolarEdge, TPI Composites
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Sales of energy efficiency products which can make homes and offices more aware of consumption (meters) or resource efficient such as insulation, LEDs, heat pumps, etc and companies which deliver such projects. Products which help improve air quality including EVs, e-bikes, E-buses, batteries, auto catalyts.	Ameresco, Hubbell, Nibe, Johnson Matthey, LG Chem, Samsung SDI, Itron, TPI Composites, Trane Technologies, Infineon, Installed Building Products
12. RESPONSIBLE CONSUMPTION & PRODUCTION	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Manufacture of products using less energy / fewer raw materials, water and gas metering, battery recycling, waste to energy (bagasse biomass). Repair and maintenance services which avoid scrappage of higher value items.	Hubbell, Johnson Matthey, Itron, Eaton
13. CLIMATE ACTION	13.2 Integrate climate change measures into national policies, strategies and planning.	Displacement Reducing energy consumption via energy efficiency and alternative fuels.	Ameresco, Hubbell, Nibe, Trane Technologies, Installed Building Products
		Electrification Reducing transport emissions by transitioning towards battery electric vehicles.	Johnson Matthey, LG Chem, Samsung SDI, Aptiv, Gentherm, Onsemi, Infineon, Sensata
		Installation Manufacturing and installing the equipment and infrastructure required to enable low carbon energy generation.	Itron, Schneider, Eaton, Canadian Solar, Enphase, First Solar, SolarEdge, Xinyi, TPI Composites, Vestas, Legrand
		Generation Increasing the percentage of energy generated from renewable and alternative sources.	China Longyuan, China Suntien, Iberdrola, Nextera, Ormat, Sunnova, Orstead

Portfolio holdings as of 31st December 2023.

APPENDIX 4: DISCUSSION POINTS AROUND IMPACT METHODOLOGY

1. IMPACT REPORTING IS SUBJECTIVE

This document outlines how the Sustainable Energy team thinks about impact investment. By the nature of the topic, these views can be highly subjective. We debate our own impact methodology internally and with others in the impact community and expect our methodology to evolve as more data becomes available, and as industry standards emerge.

2. DOES A COMPANY NEED TO HAVE GOOD ESG TO BE AN IMPACT INVESTMENT?

We believe that impact is about the “what”, whereas ESG is more about the “how”. That said, we take ESG into account in our investment process. We take a holistic view of our investments, assessing strategy, financials, valuation, ESG and impact. If a company has a compelling strategy, is attractively valued and has a product with a strong positive impact, we are willing to tolerate some ESG issues and use these as a catalyst for engagement. We would then track the company’s ESG behaviour, looking for improvement over time.

3. HOW DO YOU ACCOUNT FOR THE IMPACT OF THE STRATEGY CHANGING OVER TIME?

The impact of our strategy is likely to change over time as a result of changing allocations across our four subsectors (efficiency, electrification, installation, generation), depending on where we think the most attractive returns are available. Changes in company market capitalisations will also have an effect on the impact relative to a specific amount of portfolio assets. Over time, we are more focused on the impact trajectories of the individual investee companies than the overall portfolio outcome. A material change in strategy at an investee company, leading to a de-emphasis on the division(s) which generate positive impact, would cause us to re-visit our investment thesis and engage with the company to understand the shift.

APPENDIX 5: GLOSSARY

Carbon intensity: Amount of carbon dioxide (CO₂) emissions produced per unit of output.

CO₂E: A unit of measurement that compares different greenhouse gases based on their contribution to global warming and climate change.

Greenhouse Gas (GHG) Protocol: Provides international greenhouse gas accounting standards and a global framework to help countries measure and manage greenhouse gas emissions from both the private and public sector, and track progress towards climate goals. *Source: Greenhouse Gas Protocol*

Heating, Ventilation, and Air Conditioning (HVAC): Systems and technologies used to regulate the temperature, humidity, and purity of the air in an enclosed space.

IPP: Independent Power Producers, commonly called IPPs, are independent owners of generation that are not part of the regulated utility. *Source: Energy Knowledge Base*

LCOE: Levelized cost of electricity, a metric used to assess the average cost of generating electricity from a particular energy source over its entire lifetime.

Scaling factor: In our scope 4 emissions calculation methodology we apply scaling factors to adjust the emissions displaced by the company products downwards, to reflect the products contribution to the final impactful product cost.

Scope 1: Emissions from sources owned or controlled directly by an organisation, such as burning of gas in on-site boilers. *Source: National Grid*

Scope 2: Emissions from indirect sources but used or bought by the organisation, such as energy produced elsewhere but used by the organisation’s buildings. *Source: National Grid*

Scope 3: Emissions from indirect sources upstream and downstream of the value chain of an organisation that it is responsible for, such as product-level emissions or those from business travel. *Source: National Grid*

Scope 4: Emissions ‘avoided’ by an organisation, or a reduction in emissions that “occurs outside of a product’s life cycle or value chain but as a result of the use of that product”. *Source: World Economic Forum*

SDGs: The 17 Sustainable Development Goals were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. *Source: UNDP*

Solar inverters: A device that converts direct current (DC) electricity (which is what solar panels generate) to alternating current (AC) electricity, which the electrical grid uses.

Solar modules: Also known as solar panels, are devices composed of multiple interconnected photovoltaic (PV) cells that convert sunlight directly into electricity.

The Paris Agreement: A legally binding international treaty on climate change, adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, in 2015. The Paris Agreement aims to limit global average temperature rise to well below 2°C above preindustrial levels, and to pursue efforts of limiting this to 1.5°C. *Source: UNFCCC*

Total Shareholder Return (TSR): A performance metric that reflects the total return an investor earns from holding a company’s stock over a specific period.

IMPORTANT INFORMATION

Issued by Guinness Global Investors, which is a trading name of Guinness Asset Management Limited which is authorised and regulated by the Financial Conduct Authority.

This report is primarily designed to inform you about the Guinness Sustainable Energy Fund and the WS Guinness Sustainable Energy Fund. It may provide information about the Funds' portfolios, including recent activity and performance. It contains facts relating to the equity markets and our own interpretation. Any investment decision should take account of the subjectivity of the comments contained in the report.

This document is provided for information only and all the information contained in it is believed to be reliable but may be inaccurate or incomplete; any opinions stated are honestly held at the time of writing but are not guaranteed. The contents of the document should not therefore be relied upon. It should not be taken as a recommendation to make an investment in the Funds or to buy or sell individual securities, nor does it constitute an offer for sale. OCFs for all share classes are available on www.guinnessgi.com.

GUINNESS SUSTAINABLE ENERGY FUND Documentation

The documentation needed to make an investment, including the Prospectus, Supplement, Key Investor Information Document (KIID), Key Information Document (KID) and Application Form, is available in English from www.guinnessgi.com or free of charge from the Manager: Waystone Management Company (IE) Limited 2nd Floor 35 Shelbourne Road, Ballsbridge, Dublin DO4 A4E0, Ireland; or the Promoter and Investment Manager: Guinness Asset Management Ltd, 18 Smith Square, London SW1P 3HZ.

Waystone IE is a company incorporated under the laws of Ireland having its registered office at 35 Shelbourne Rd, Ballsbridge, Dublin, D04 A4E0 Ireland, which is authorised by the Central Bank of Ireland, has appointed Guinness Asset Management Ltd as Investment Manager to this fund, and as Manager has the right to terminate the arrangements made for the marketing of funds in accordance with the UCITS Directive.

Investor Rights

A summary of investor rights in English is available here:

<https://www.waystone.com/waystone-policies/>

Residency

In countries where the Fund is not registered for sale or in any other circumstances where its distribution is not authorised or is unlawful, the Fund should not be distributed to resident Retail Clients. **NOTE: THIS INVESTMENT IS NOT FOR SALE TO U.S. PERSONS.**

Structure & regulation

The Fund is a sub-fund of Guinness Asset Management Funds PLC (the "Company"), an open-ended umbrella-type investment company, incorporated in Ireland and authorised and supervised by the Central Bank of Ireland, which operates under EU legislation. If you are in any doubt about the suitability of investing in this Fund, please consult your investment or other professional adviser.

Switzerland

This is an advertising document. The prospectus and KID for Switzerland, the articles of association, and the annual and semi-annual reports can be obtained free of charge from the representative in Switzerland, Reyl & Cie S.A., 11, Rue du Rhône 4, 1204 Geneva. The paying agent is Banque Cantonale de Genève, 17 Quai de l'Île, 1204 Geneva.

Singapore

The Fund is not authorised or recognised by the Monetary Authority of Singapore ("MAS") and shares are not allowed to be offered to the retail public. The Fund is registered with the MAS as a Restricted Foreign Scheme. Shares of the Fund may only be offered to institutional and accredited investors (as defined in the Securities and Futures Act (Cap.289)) ('SFA') and this material is limited to the investors in those categories.

WS GUINNESS SUSTAINABLE ENERGY FUND Documentation

The documentation needed to make an investment, including the Prospectus, the Key Investor Information Document (KIID) and the Application Form, is available in English from www.waystone.com/our-funds/waystone-fund-services-uk-limited/ or free of charge from Waystone Management (UK) Limited, PO Box 389, Darlington DL1 9UF. General enquiries: 0345 922 0044. E-Mail: investorservices@linkgroup.co.uk

Waystone Management (UK) Limited is authorised and regulated by the Financial Conduct Authority.

Residency

In countries where the Fund is not registered for sale or in any other circumstances where its distribution is not authorised or is unlawful, the Fund should not be distributed to resident Retail Clients.

Structure & regulation

The Fund is a sub-fund of WS Guinness Investment Funds, an investment company with variable capital incorporated with limited liability and registered by the Financial Conduct Authority.

Telephone calls will be recorded and monitored.



Guinness Global Investors is a trading name of Guinness Asset Management Ltd., which is authorised and regulated by the Financial Conduct Authority (223077).

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