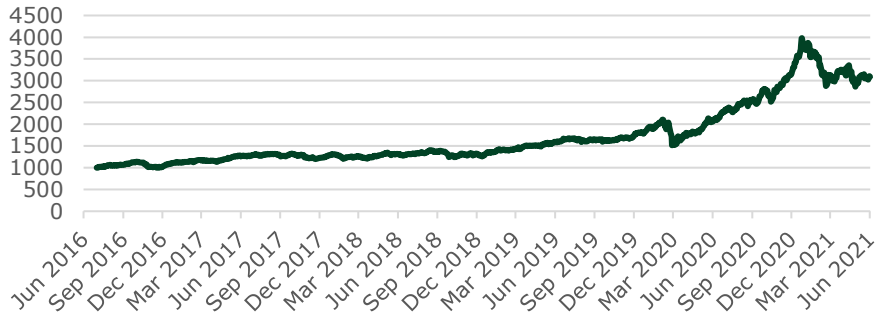
Active Net Zero Clean Energy Index

Active Net Zero Clean Energy Index Performance



Source: FactSet, Longspur Radnor Indices

Longspur Research and Radnor Capital Partners have launched the Active Net Zero Clean Energy Index to allow investors to measure the performance of companies actively enabling climate solutions.

The key emphasis is on the word "active". This pan-European index eliminates greenwashing by penalising fossil fuel activities and focuses on actual achievement and positive contribution, rather than promises for the future.

Our proprietary selection methodology is systematic, rules based and quantifiable. The methodology is aligned with the EU Taxonomy, the IPCC 1.5°C Report pathways, and the IEA Roadmap.

Longspur Radnor Indices Limited

A joint venture between Longspur Capital and Radnor Capital Partners

- **Enablers not compliers**. Complying with net zero targets is an honourable aim. However, enabling net zero solutions is where investment can deliver real change. Our index identifies enablers rather than compliers. Many companies are complying or moving towards compliance with clean emission targets. This is certainly positive, but we know investors are looking for more. We are targeting the enablers who are delivering clean energy solutions for everyone, not just themselves.
- **Performance not promises**. Our index includes companies based on their current contribution to the energy transition, not just their promised contribution. Many companies have well-meaning statements of strategy about how they will comply with net zero targets; we look at actual company delivery.
- **Penalising fossil fuel**. The IEA has said that as of this year there is no need for new fossil fuel investments if we are to reach net zero. As a result, our index penalises fossil fuel activities. But companies with fossil fuel exposure are not excluded per se because many of them have essential skills to deliver key elements of the energy transition. Our index only includes them when active net zero activities dominate. Again, we are avoiding promises and focusing on actual performance. **There may be more joy in heaven over a sinner who repents, but they do have to do more than just promise to repent**.
- **Externally aligned with 1.5°C target.** Eligibility criteria for inclusion in our Active Net Zero Clean Energy Index is externally defined using the EU Taxonomy for Sustainable Activities and selecting activities which are on the pathways set out by the IPCC in its Special Report on Global Warming of 1.5°C and more recently in the IEA's Roadmap to Net Zero report.

Contact us for more details. To learn more or to apply for an index data or product licence please speak to your regular **Radnor** or **Longspur** contacts. Alternatively visit us at www.activenetzero.com.

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Adam Forsyth
Head of Research
Longspur Research
adam.forsyth@longspur.com

Iain Daly
Director
Radnor Capital Partners
id@radnorcp.com

Alternatively

info@activenetzero.com

www.activenetzero.com

The Active Net Zero Clean Energy Index – An Introduction

Longspur Capital and Radnor Capital Partners have created the Active Net Zero Clean Energy Index on the back of increased demand for exposure to clean energy as we move towards a net zero world. The carefully constructed and selective index provides the basis for informed investment decisions. Whilst we have seen several ESG indices and 'green' performance indicators published in recent years, we believe there is a real opportunity to develop an index with a clear selection methodology based around positive contribution, rather than merely passive compliance. Put simply, we believe the constituents of this index are accelerating the drive towards a net zero future.

Longspur Radnor Indices Limited defines an Active Net Zero company as one which is actively helping others in the transition to a net zero world, not simply achieving net zero themselves throughout their operations. This distinction is encapsulated throughout the index methodology in the distinction between what are 'Active' net zero activities and what are considered 'Passive' net zero activities based on a company's operations. Whilst passive activities are welcomed and encouraged, this index is designed to represent the performance of companies which are 'actively' contributing to global net zero.

Longspur Radnor Indices Limited is a joint venture between Longspur Capital and Radnor Capital Partners and provides two tools to help investors target active net zero.

1. The **Active Net Zero Clean Energy Index** is a published (Ticker **ANZNRG**), investable index and benchmark[1] based on the top 50 European listed companies who have passed our stringent Active Net Zero eligibility criteria as well as the liquidity screening thresholds based on market cap and trading volumes. This index is also UCITS compliant with a single stock weighting limit of 9%.

2. The **Active Net Zero Clean Energy Equal Weight Universe Index**, is a research index[2] including all listed European companies who have passed the Active Net Zero eligibility criteria based on the revenue methodology with no limit to the number of companies included, equal weighted and with no exclusions based on liquidity thresholds or market capitalization size.

The purpose of launching these two indices side by side is so they can be used as both a standalone research index and as part of an ESG investment strategy utilising the same systematic, rules-based eligibility methodology.

[1] A published non-significant Benchmark for evaluating fund performance within the scope of UK BMR/ESMA regulations. Elston Indices is the Benchmark Administrator for the Active Net Zero Clean Energy Index. Longspur Radnor Indices is a Benchmark Contributor to the Active Net Zero Clean Energy Index. For more information, see Notices.

[2] For research and illustrative purposes only, not a Benchmark as per UK BMR/ESMA definitions.

Active Net Zero – The Concept

The IPCC Special Report on Global Warming of 1.5°C requires the world to eliminate net greenhouse gas emissions by 2050 if it is to keep global warming to within 1.50C of pre-industrial levels and avoid the worst impacts of climate change. Pursuing this target is consistent with the Paris Agreement and countries representing over 60% of global emissions have already announced net zero targets including the USA, EU, China, Canada, Japan and South Korea. In fact, all the G7 countries except Italy have announced net zero targets.

The IPCC report shows that failing to achieve net zero will leave the world and its economies exposed to severe risk. We believe investors who want the environment to be considered in their investment strategies will want those investments to be consistent with a net zero approach. Increasingly, investing in activities that are not consistent with net zero will be seen as out of mandate. We also believe that a significant number of investors want to invest in delivering a net zero solution, not just complying with it. This is where active net zero is important.

The Institutional Investors Group on Climate Change (IIGCC) represents over 300 members with over US$45tr of assets. It sees two dimensions for investors to be considered in alignment with the temperature goals of the Paris Agreement.

Two dimensions for investors

Decarbonising investment portfolios in a way that is consistent with achieving this net zero goal

Increasing investment in 'climate solutions' required to meet that goal, such as renewable energy, low carbon buildings, and energy efficient technologies

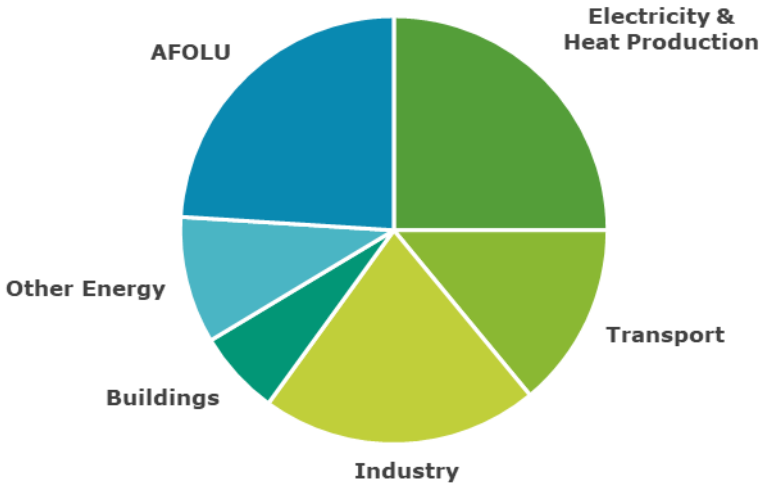
Source: IIGC

We describe companies in the second dimension as Active Net Zero companies; those actively working to deliver a net zero solution.

Targeting Emission Reductions

The IPCC 1.5°C report studied 90 pathways to achieve a net zero solution. If we look at where emissions are generated, we can see that roughly a quarter are from electricity and heating, a quarter from agriculture, forestry and other land use (AFOLU), a fifth from industry, a seventh from transport and the rest from other industry and buildings.

Global GHG emissions by sector (2015)



Source: London Stock Exchange, RNS, Radnor

How Can We Reduce Emissions?

Electrification through renewables is key

Electricity and heating emissions can be eliminated largely through the use of renewable electricity. Heating has certain challenges, but a number of options exist, and most are a form of electrification; heat pumps, infrared and green hydrogen can all be driven by renewable electricity. Blue hydrogen is the only major solution not to rely on electricity.

Renewables have issues of place, price and timing

Despite strong progress, it is not easy to replace fossil fuelled electricity with renewables. While locational changes to the electricity system can be met by investment in power grids, market structure issues are more problematic. The near zero marginal cost attributes of renewables can result in "missing money" leading to lack of investment. There are solutions to this, the most obvious of which is to combine renewables with storage, increasing demand for storage.

Renewables also reduce the ability of networks to maintain a set frequency. Deviation from this can lead to system failure and damage connected equipment. Generation which provides spinning reserve is the key solution here and includes nuclear, hydrogen gas turbines and biomass. Nuclear's inflexibility can itself be solved by matching it with hydrogen electrolysers. Overall, these lead to increased demand for hydrogen and biomass.

Storage enables transport solutions but again there are issues

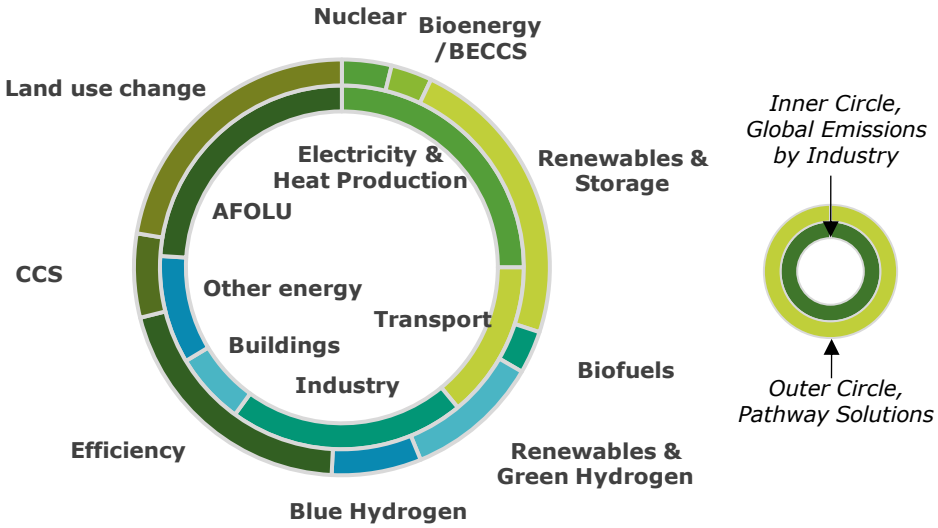
Transport emissions can be eliminated though electrification, which means battery electric vehicles for light duty and medium range applications including the bulk of passenger cars. This will drive demand for lithium-ion batteries. However, lithium-ion and other battery technologies do not scale well with range, and hydrogen fuel cells are more appropriate for heavier duty applications. This extends to short haul aviation where hydrogen solutions are making progress using existing airframes. For longer haul aviation biofuels are the key solution.

Industry and land use have solutions but we will also need NETs

Industrial emissions can be replaced by some electricity. Efficiency is also a major driver here, but hydrogen is perhaps the biggest opportunity. Land use change is the final opportunity for a significant decarbonisation of emissions. Beyond this we need to rely on negative emission technologies (NETs) of which the key are biomass energy and carbon capture and storage (BECCS).

Putting this together and comparing with existing emissions shows where the solutions lie, broadly matched with the specific emission problems they solve.

Global Emissions and Solutions



Source: IPCC, Longspur Research

We translate this energy demand into capacity needs on a 2050 timeframe. We can compare these forecasts to a number of others in the market, with those from BNEF and IRENA being perhaps the most comprehensive. Most recently the International Energy Agency (IEA) has published a major report outlining a road map to global net zero greenhouse gas emissions by 2050. This sets out their view of how the world can reach a net zero target. The main differences between the IEA's work and that of the IPCC pathways are an assumption of greater hydrogen usage and less bioenergy but otherwise the views are broadly in line with the median low overshoot IPCC pathways.

Implied 2050 capacity for global net zero

	IEA	Longspur	BNEF	IRENA
Renewable Energy (GW)	26,568	22,486	20,301	18,377
Storage EV (BEVs, m units)	na	1,090	414	1,109
Storage ESS (GWh)	12,388	10,304	5,827	9,000
Hydrogen production (Mt)	528	781	697	240
Green hydrogen (GW)	3,585	4,957		1,700
BECCS (GW)	152	807		
Nuclear (GW)	812	864		
Biofuels (TWh)	4,167	5,864		
Efficiency (TWh)	10,596	35,897		
Land use change (TWh)	na	39,536		

Source: IEA, Longspur Research, BNEF, IRENA

Identifying Active Net Zero Companies

The Longspur Radnor Index methodology is based on company revenues.

To be eligible for inclusion, a company must have an Active Net Zero Score of at least 50% based on company revenues from Active Net Zero activities. Revenues are segmented based on whether they are active, passive or negative. Negative net zero activities are those based on fossil fuels including coal, oil and natural gas. Whilst companies that produce fossil fuels can be included, revenues from this sector count against its active revenues, making it difficult for those with significant fossil fuel activities to be included.

There is some merit in using capex rather than revenue as it is a good sign of a company's intentions. However, we are concerned with what a company is doing now rather than what it intends to do, and capex is seldom shown in segmental notes to annual accounts, making its use here difficult. However, where segmental capex is available, we are happy to include companies on that basis.

As the clean energy sector includes early-stage technologies, a number of companies are pre-revenue. Where a company is pre-revenue or does not have revenue in a specific year, we are happy to use segmental opex. We see the inclusion of these companies as a key differentiator of the index, especially as, in order to achieve net zero, development of these technologies needs to be accelerated. The 2020 Energy Technology Perspectives report highlights that technologies required to meet around 75% of the emissions reductions needed for net zero are currently not mature.

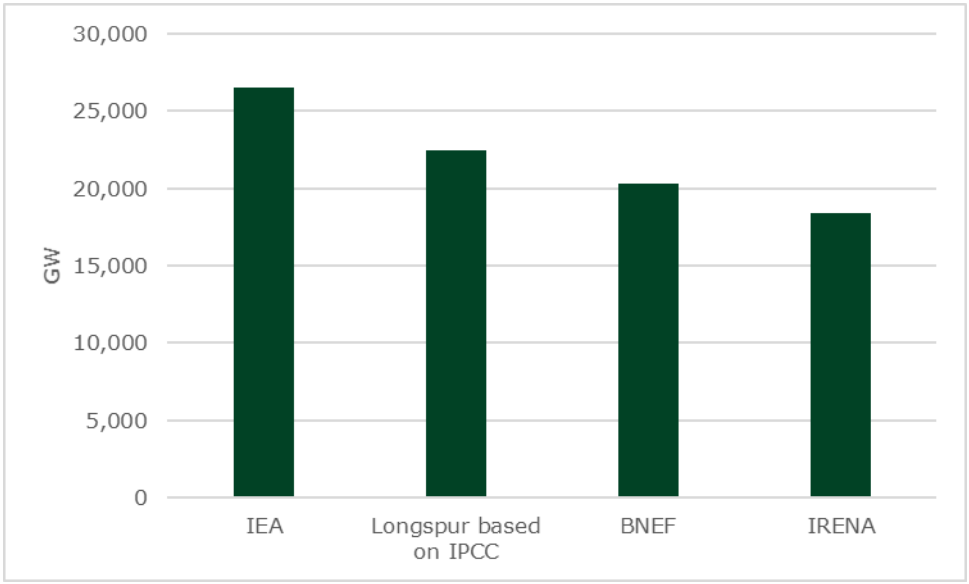
Identifying Active Net Zero Activities

In order to use widely accepted definitions, we consider net active zero activities to be those outlined in the following sections of the Annex to the EU Sustainable Finance Taxonomy (Regulation 2020/852 of the European Parliament and of the Council); 3.1 – 3.5, 3.9, 3.14 and 4.1 – 4.25. Under 3.5, Manufacture of other low carbon technologies, we include the supply of materials for low carbon technologies including mining of key minerals such as lithium, graphite, manganese and cobalt for energy storage where this is done sustainably. These activities are in line with the pathways set out in the IPCC Special Report on Global Warming of 1.5°C and in the IEA Net Zero by 2050 Roadmap.

As currently drafted, the Taxonomy omits nuclear energy, but this is still a matter of debate. For the purposes of this index we include electricity generation and hydrogen production from nuclear fission and fusion. While there are many good reasons to discard these technologies, they remain contributory technologies to a net zero world, which is the focus of this index.

Negative net zero activities are those based on fossil fuels including coal, oil and natural gas. Transition technologies which will not be part of a net zero end game are treated as per their net zero world contribution, which may be negative. So, for example, gas generation revenue will be treated as revenue that detracts from a net zero world.

Implied 2050 Renewable Energy Capacity for Global Net Zero



Source: IPCC, Longspur Research, IEA, BNEF, IRENA

Activities Summarised

The eligible renewable energy businesses accepted for inclusion in the index and therefore considered an Active Net Zero activity are detailed below.

Renewables - Wind & Solar:

Company in the wind sector are involved in the manufacturing of turbines or associated parts, are wind developers and or generators, or are involved in the development of technologies for wind turbines. Generators of electricity using PV material, solar developers or companies engaged in the development of solar technologies are eligible.

Renewables - Biomass & Biofuels

Eligible companies are involved in biomass through the process of using plant or animal material as fuel to produce electricity, heat or biofuels. Under the Index methodology, eligible companies that supply the biomass are involved in engineering the technology and or equipment or are involved in the production or consumption or biomass as fuel for electricity, heat or biofuel.

Small Scale Renewables - Hydro power, tidal and geothermal

Hydroelectric generation is eligible as are of other small-scale technologies that can be more reliable than wind and solar in adverse conditions. Geothermal power uses natural heat below the earth's surface to generate electricity and whilst this form of renewable generation is only significant in areas where this form of natural heat is readily available, it forms an important part of the energy mix in a net zero world.

Energy Efficiency

Companies are considered eligible in this sector if through developing technologies they are able to improve efficiency of both generation and distribution of electricity. Technologies can range from reducing losses on the grid, or reducing use of energy in homes, retail or commercial buildings.

Hydrogen

Hydrogen technology could be a significant driver in the energy transition. A company is eligible if it is involved in the production and storage of green or blue hydrogen, as well as hydrogen and fuel cell technologies or alternative fuel vehicles using hydrogen.

Energy Storage

Due to the intermittency of renewables such as wind and solar, energy storage and battery technologies are crucial in the shift to net zero. Eligible companies in the energy storage sector are involved in the development of battery technology or other forms of energy storage solutions, such as EV charging and the manufacturing of EVs.

Mining

Mining of materials used for low carbon technologies including mining of key minerals such as lithium, graphite, manganese, and cobalt for energy storage, where this is done sustainably.

Issues along the Value Chain

There are issues where a company such as an energy retailer supplies both low renewable and fossil fuel derived energy. In these cases, the positive and negative impact of the revenue from each source are weighed against each other. If the revenue is not split, we estimate a split based on any other disclosed supply data. Similarly, grid (transmission) companies are assessed on how much clean and dirty power is being transmitted. Traditional grids and retailers themselves do not bring about the changes required but initiatives such as smart grid technologies and smart meters are enablers and we count as positive contributions.

The coal fired car

We see the manufacture of EVs as a key element of a net zero world. There have been a number of papers pointing out that at present where these vehicles charge on grids which are fossil fuel dominated, they do not contribute to mitigating climate change. However, we assume that grids will move to a net zero solution so that the EVs are then essential to decarbonising a key section of transport needs.

Energy efficiency

Energy efficiency is a key route to meeting net zero targets. For some observers there is no difference between a low energy LED lightbulb and a low emission gas turbine. Of course, gas turbines are still relative high emission, whereas LED lightbulbs are a major leap (notwithstanding the Khazzoom-Brookes postulate). However, our key criteria are that LEDs are part of the zero-emissions end game but combined cycle gas turbines (CCGTs) are not. So, we include efficiency but not CCGTs. For the same reason we exclude bus companies unless the majority of their journeys are in low emission vehicles.

Waste to energy

We consider the biogenic content of waste to energy as an active net zero activity. For most commercial waste we consider this at 50% if no other information is available. While the remaining content can be seen as a negative contributor to a net zero world, we see the offsetting benefits of dealing with unrecyclable waste as a benefit and allow this to be treated as a neutral activity.

Blue hydrogen

Hydrogen produced from methane, using steam methane reformation with carbon capture and storage can be a viable low carbon solution whilst producing the significant quantities of hydrogen required for decarbonising industry. As such we see it as a positive activity in a net zero world.

Mining

We see similar issues with mining where mined material can be used in a variety of applications. Some may be active net zero, but not all. For example, where a graphite mine supplies exclusively to battery anode producers, this is clearly an active net zero activity. But if less than half of this mine supplies such an activity it would not be suitable for this index.

The key question in making these distinctions is **"will the activity contribute to a net zero world beyond the company itself?"**

Eligibility and Screening Criteria

The universe is all European listed companies with Europe, defined as the European Economic Area plus Switzerland and the UK.

To be eligible for inclusion in the Index, constituent companies are subject to the following screening criteria:

• Have an Active Net Zero score of at least 50% based on a company's revenue characteristics

• Minimum free float adjusted market capitalisation criteria

• Minimum trading volume criteria

• Subject to individual security maximum weightings cap.

Rebalancing will be carried out annually on 30 June.

Longspur Radnor Indices Limited is a joint venture between:

Longspur Research

Longspur Research	**Longspur Capital**
10 Castle Street,	20 North Audley Street,
Edinburgh. EH2 3AT	London. W1K 6WE
UK	UK

www.longspur.com

Radnor Capital Partners

Radnor Capital Partners

1 King Street

London

EC2V 8AU

www.radnorcp.com

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1 King Street, London, England, EC2V 8AU