

Investing in the future of energy

We believe the future of energy must involve helping the world meet its net-zero ambitions, and in our view three areas of innovation will be central to doing so.

Some \$130 trillion of investment is needed to achieve global net-zero emissions (including \$20 trillion by 2025)¹ – an essential investment in our future world, but also an investment opportunity in itself. For investors, the path to net zero is thus more than a social imperative; it is also an opportunity to align portfolios with climate objectives and invest in a long-term growth market focused on effecting positive change.

Supported both by net-zero targets becoming increasingly enshrined in law, and by scientific advances and scale effects making their adoption more economic, we believe three types of energy technology will in combination facilitate the transition to a decarbonised world and benefit from the waves of investment into climate and environmental solutions.

Clean energy:

This market, related to the production of clean energy, spans equipment manufacturers, technology suppliers, and utilities and power producers, each of which will be vital in helping the world address the climate emergency. We believe the market for clean energy is poised for sustained growth through a virtuous cycle of investment, technological advancement, and increased adoption.

Battery technology:

Yet the potential of clean energy will be limited without better and more extensive battery storage. Improved energy storage can help overcome the short-term intermittency – due to daylight hours or fluctuating weather – of renewable sources. Without an upgraded storage infrastructure, much of the electricity that could potentially be generated by renewables will be lost, and coal and gas-fired power stations will remain necessary to cover supply shortfalls. Battery technology is also integral to the process of replacing internal combustion engine vehicles with electric alternatives.

Hydrogen economy:

The combination of clean energy and batteries can only take the world some of the way to net zero, however. Many areas of the economy – such as heavy-goods vehicles, shipping, and some aspects of heavy industry and home heating – will be hard to decarbonise with just the aforementioned technologies. Hydrogen power and fuel cells are becoming a viable alternative in these spaces.

Together, we believe these three themes can offer a portfolio exposure to long-term secular growth markets, diversification potential relative to a market-cap benchmark, and a tangible ESG impact and alignment to the UN's Sustainable Development Goals.

1. Source: Legal & General, 2021: https://www.legalandgeneralgroup.com/media/18405/lg-ar-2020_web-final.pdf.

Capturing the future of energy in a thematic portfolio

Each of these three themes is still at a relatively early stage of development. This has two important implications for us:

1. These themes span traditional sectors and geographies, so we believe we need to work with specialists in each of them to identify both the full global value chain and the individual companies most closely involved.
2. The rapid growth we expect in each of the themes means we prefer to seek diversified exposure to the full value chain, rather than trying to pick 'winners'.

So what kinds of company does our active research process identify? We highlight some case studies of recent innovation in each theme below, but would again emphasise that we are not seeking to pick 'winners' in these themes. Rather, our approach seeks to provide exposure to a diversified basket of stocks selected based on custom metrics specific to that theme. We believe this should provide purer access to each theme.

Battery technology:

Eos Energy* is an energy-storage manufacturing company, headquartered in the US. The company's flagship product is the Znyth aqueous zinc battery. Although the battery is made with a small selection of low-cost, widely available, recyclable materials, it has a longer life than lithium-ion batteries. It also works safely in extreme hot and cold temperatures.

Clean energy:

Japan's Hitachi Zosen* has built 490 energy-from-waste (EfW) plants globally and provides their primary equipment. Using EfW to generate heat to warm homes can help avert both the high costs of shipping waste abroad and the environmental challenges of landfill sites. "Heat networks are playing a vital role in decarbonising the way we warm our homes and businesses," according to Kwasi Kwarteng, the UK's Secretary of State for Business, Energy and Industrial Strategy.



Hydrogen economy:

Linde* is a European industrial gas and engineering company that covers every step in the hydrogen value chain, with over 100 years of experience in hydrogen production. It was selected in March 2021 by Norwegian ferry operator Norled to supply liquid hydrogen and related infrastructure to the world's first operational hydrogen-powered ferry, and also this year announced plans to build, own, and operate the world's largest proton exchange membrane (PEM) electrolyser – one of the key techniques for green hydrogen production.

We hope this demonstrates the depth of research undertaken in designing our themes and some of the exciting technologies within our own 'future of energy' portfolios.

Key risk

The value of an investment and any income taken from it is not guaranteed and can go down as well as up; you may not get back the amount you originally invested.

Our Hydrogen Economy and Clean Energy strategies were recently launched, so will be considered for inclusion in the Global Thematic strategy at the management team's discretion.

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*For illustrative purposes only. Reference to a particular security is on a historical basis and does not mean that the security is currently held or will be held within an LGIM portfolio. The above information does not constitute a recommendation to buy or sell any security.

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