Investing in climate change solutions

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Climate change solutions strategy

Climate Change is one of the largest systemic challenges we face – affecting the way we live, work and interact with our environment. Addressing it will require input and change from every government, company and individual around the globe. And it will take meaningful investment and widespread innovation – in generating and storing clean forms of energy, improving the electrical grid, increasing the energy efficiency of buildings and developing less carbon intensive methods of travel, farming and more.

Our Climate Change Solutions strategy seeks to invest in companies providing the products and services that will enable emissions reduction across the economy. The strategy combines expertise in artificial intelligence and big data with human insight to identify climate change solutions providers across sectors and regions, and from large and mega cap to small – investing in a compelling opportunity from both a sustainable and an investment perspective.

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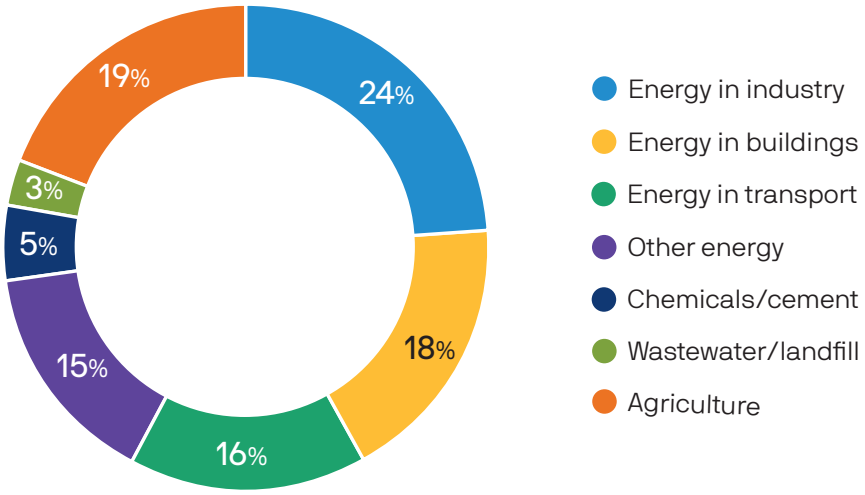
Categorising climate change solutions

We begin by breaking down the key drivers of climate change: where are our greenhouse gas emissions coming from?

Global greenhouse gas emissions by sector

% of global greenhouse gas emissions (2016), CO_2 equivalent tonnes



Source: Climate Watch, Our World in Data, World Resource Institute, J.P. Morgan Asset Management. Greenhouse gas emissions include CO_2, methane, nitrous oxide and fluorinated greenhouse gases. CO_2 equivalent tonnes standardise emissions to allow for comparison between gases. One equivalent tonne has the same warming effect as one tonne of CO_2 over 100 years. *Guide to the Markets - Europe*. Data as of 30 September 2021.

We then identify the solutions that are being developed to mitigate each of these major drivers. We have grouped these solutions into five categories.

Renewables & electrification

Consumption of fossil fuels as a form of energy drives nearly three-quarters of annual greenhouse gas emissions, so identifying and implementing alternative forms of energy is key.

Companies in this category could include those sourcing all of their revenue from the generation of wind power or solar electricity, or incumbent utilities converting their business models to renewables. The category also includes companies that provide the equipment needed for the production of renewable energy, such as wind turbine and solar equipment suppliers.

An equally significant investment opportunity is electrification. Almost all of the new technologies that reduce the need for fossil fuels – renewable energy to replace power plants; electric vehicles to replace combustion engines; heat pumps to replace gas boilers – will themselves rely on electricity. Meaningful investment in the electric grid is therefore required to support the transition. Electrification enablers provide equipment including software used in power management; inverters and other hardware needed in the electrification process; and batteries for energy storage. The breadth of equipment required and the technological innovation in this space mean it is currently the area in which we find the most opportunities.

There are two other key areas of innovation in this category: hydrogen as an energy source and carbon capture. While both are early stage today, they could be truly transformational in the future. We discuss how we think about allocating to early-stage ideas in a portfolio context later.

Renewables solutions in practice

Underneath the Skagerrak strait, an intricate system of transistors, capacitors and high voltage cables connects Denmark's wind and thermal-driven electricity grid to Norway's hydroelectric power plants. Since wind power can be intermittent, this connection provides stability and enhanced support during grid failure – key to supporting the use of renewable energy.

Sustainable construction

Buildings, both residential and commercial, are a major source of greenhouse gas emissions. Governments across the globe are embracing the idea of net zero buildings and are introducing laws to encourage companies and consumers to move in that direction. Continual innovation in this area is providing us with many investment opportunities.

For example, heating, ventilation and air conditioning (HVAC) is a major consumer of energy in a building, so companies innovating in this sector are at the forefront of the fight against climate change. Upgrading HVAC systems can lead to a meaningful reduction in the carbon footprint of a commercial or residential building. Other opportunities in sustainable construction include companies involved in, roof and wall insulation, heat pumps and less carbon-intense forms of construction.

Sustainable construction solutions in practice

Heating in buildings is responsible for 10% of global emissions. Heat pumps, powered by low-emissions electricity, are currently 3-5 times more energy efficient than gas boilers. The IEA estimates heat pumps globally have the potential to reduce global CO_2 emissions by at least 500 million tonnes in 2030 - equal to the annual CO_2 emissions of all cars in Europe today.

Source: **https://www.iea.org/reports/the-future-of-heat-pumps**

Sustainable food & water

The global agriculture system contributes about 19% of global greenhouse gas emissions – through fertiliser use, soil erosion and deforestation, as well as through methane produced by cattle, among other factors. It is also a leading contributor to water stress.

But companies are innovating in this area to address the sustainability challenge while still providing the food and resources we need to support the planet.

One example is companies investing in precision agriculture: innovative technologies that allow farmers to increase their yield through efficient use of resources. As well as boosting yield, precision agricultural equipment and technology allows for reduced herbicide use and improves planting speed and spraying accuracy. Elsewhere in this space, we see opportunities in companies that enable the purification of water and consultants specialising in water and the wider environment.

Sustainable agriculture solutions in practice

Precision agriculture technologies are not just good for the planet – they can also be good for business. Farmers who use precision agriculture technologies from one of the leading providers can save over 1,600 gallons of diesel, 250,000 pounds of fertiliser, and USD 180,000 of input costs per year.[1]

[1]Source: Deere & Co., as of 2020.

Sustainable transport

Transportation generates around 16% of annual greenhouse gas emissions around the globe, with cars the least efficient.[2]

The technology behind electric cars has improved meaningfully, with battery life growing, the cost of production coming down and charging stations becoming more widely available. The premium to purchase an electric car relative to a traditional combustion engine continues to narrow, with subsidies and regulation providing support.

In our portfolio, we are identifying opportunities across the investment chain – including both pure-play companies and larger automotive companies committing meaningful resources to build electric vehicle capabilities, as well as companies providing valuable inputs such as batteries.

[2] Source: Our World in Data, as of 30 September 2021.

Sustainable transport solutions in practice

The electric vehicle market is seeing exponential growth, with the IEA anticipating 14 million electric cars sales by the end of 2023, representing a 35% year-on-year increase.

Source: **https://www.iea.org/energy-system/transport/electric-vehicles**

Recycling & re-use

The final piece of the climate change solutions puzzle is a focus on recycling and re-use, which can help to limit the use of resources in the development of new goods by re-using existing materials. This is an area with enormous potential, but depends heavily on regulation. An area in which regulation is driving change in many countries is deposit schemes for glass and plastic bottles, while we also see companies encouraging a shift towards a more circular economy.

Recycling & re-use solutions in practice

Every year, roughly 1.4 trillion drinks containers are produced around the globe. The market leader in reverse vending collects and recycles 45 billion containers annually – a meaningful impact, with much more room to grow.[3]

[3] Source: TOMRA, as at 31 December 2022.

Identifying investment opportunities

Climate change solutions providers can exist anywhere, so our approach is not confined by sector, region or part of the market cap spectrum. At the same time, the opportunities are vast, and we need to navigate them carefully to ensure we're achieving both a sustainable objective and an investment-related objective. Our investment process is designed to enable us to address this opportunity set in a scalable way.

Our ThemeBot natural language processing tool enables us to cover almost 13,000 companies globally, at speed, generating a manageable list of opportunities from which to start. Companies are rated for their exposure to the theme by both textual relevance and revenue. Our analysts conduct fundamental research into the companies identified by ThemeBot, meeting with management to gain a fuller picture, and only investing in our highest conviction investment ideas.

Ensuring alignment with the sustainable objective

Our climate change solutions strategy has two key objectives: to generate an investment return and to achieve a sustainable outcome.

To ensure the portfolio is aligned with the latter of these two goals, we partner with our dedicated Sustainable Investing team. Specialists in this team contribute research insights; help us to evaluate and monitor sustainability trends; and engage with companies, experts and NGOs on climate-related topics.

At a company-by-company level, all securities are vetted through J.P. Morgan Asset Management's Sustainable Investment Inclusion Criteria framework. The framework has been designed by the Sustainable Investing team to ensure that securities across the firm's Sustainable Outcome-Driven products sufficiently contribute to an individual investment strategy's sustainable objective.

The Climate Change Solutions strategy relies on both quantitative and qualitative inputs to complete this process. First, within the broad "climate change solutions" sustainability play, we identify sub-themes related to the broader objective we are targeting: providing solutions to help decarbonise the economy and address the climate change challenge. We explore the way that these sub-themes create environmental and social benefits, as well as the mechanisms that allow for the creation of these benefits. Within these sub-themes, we target types and groups of companies. This provides the framework to ensure that we seek specific sustainability outcomes intentionally from the inception of the strategy.

Once we have identified potential investment opportunities, we consider how aligned each business is to the sustainable theme. We begin by looking at revenue. Where revenue is clearly attributed in reporting, we would expect a significant proportion of the company's revenue to be aligned to the theme.

Revenue reporting often lacks granularity, so we supplement this analysis with a robust qualitative process to determine eligibility in the portfolio. J.P. Morgan Asset Management's Sustainable Investment Inclusion Criteria framework requires a sustainability thesis for every security included in the eligible universe and resulting portfolio, covering the topics shown in the table below.

A security can only be considered for purchase after a robust rationale for its inclusion is established in partnership with the Sustainable Investing team. Once the security is included in the portfolio, this rationale continues to be evaluated.

Qualitative process to determine eligibility

What

What products and services are provided, and why are they related to the explicit sustainable objective?

Who

Who is benefiting from these products and services?

Reach/scope

At what scale are these products and services delivered? How many products are delivered, and how extensively?

Outcomes

What does the development and adoption of these products and services result in? What is the specific environmental or social outcome that is generated by these products and services?

Risks

Are there other business activities in other areas that would negate the positive environmental or social benefits created? If so, is the company planning to address this, and what is the justification for remaining comfortable with the company.

Approaching early-stage innovators vs. Solutions providers today

In the future, climate change solutions that are in their very early stages – or don't even yet exist – could become scalable realities. Cell-based meat could replace traditional cattle farms. Powerful yet environmentally-friendly jet fuels could propel airplanes around the globe. And carbon sequestration (taking carbon emissions out of the atmosphere) could become affordable and commonplace.

These concepts are exciting and innovative, and certainly deserve funding and exploration. However, as investors in publicly-listed equities, our preference is to invest in companies that are providing solutions and having a meaningful impact on the climate challenge today – rather than those that could possibly do so in the future – in line with our sustainable objective. From an investment perspective, many pure-play listed companies focused on new technologies will come with challenges including volatility, negative earnings and uncertain growth prospects.

However, we are identifying selected early-stage areas of interest which we may look to allocate to over the medium-term, notably carbon capture technologies and hydrogen as an energy carrier. In such opportunities, our position sizing will reflect the emerging nature of these solutions to balance the risk vs. other opportunities .

Carbon capture technology – technology to trap greenhouse gases emitted as part of production processes – will undoubtedly play a key role in addressing climate change, since it's nearly impossible to eliminate greenhouse gas emissions from production entirely. This is a technology that is likely to become more prominent and realistic over the next decade, and we see this as a potential area of opportunity.

Hydrogen can deliver and store a huge amount of energy to provide power or heat, and is very clean – the only output is water. However, hydrogen as an energy carrier is currently around five to seven times the cost of fossil fuel; the number of listed companies is small; and the companies are very early-stage. We do not yet have an allocation, but see this as a potential area of opportunity in the medium term.

Building a climate change solutions portfolio

The end result of our research and investment process is a high-conviction portfolio of companies sized based on their impact and alignment to the theme and our conviction in the name, and balancing considerations such as liquidity and volatility. We select quality, growth-oriented companies that we expect to perform well over a cycle, and thus anticipate a lower level of turnover at a company level.

The portfolio is diversified across sub-themes, countries, and sectors, though each investment is selected on a bottom-up basis, reflecting opportunities at the individual stock level. The result is a strategy providing diversified, high-conviction exposure to the solutions that can help us to address the existential threat of climate change.

Next Steps

For further information about our carbon transition framework, please contact your usual J.P. Morgan Asset Management representative.

LV-JPM54104 | 10/23 | 09gd212911200418 | Image sources: Getty Images and Shutterstock