

# The Anatomy of Technology-Driven Climate Investing

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By Herman Brill and Rory Dowie

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## Introduction

The COP26 summit is behind us, and although the agreements made by the 196 countries nudged the world closer to a net-zero pathway, there is still a mountain to climb. The Glasgow Climate Pact calls on governments to “Accelerate the development, deployment and dissemination of technologies, and the adoption of policies, to transition towards low-emission energy system”, including “accelerating efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies”. Greenhouse Gas (GHG) emissions need to fall by 45% compared with 2010 levels by 2030 if the world is to stay on track to reach net-zero by around mid-century. The current trajectory, however, is estimated to be 13.7% above the 2010 level in 2030. The challenge is stark.

While understanding the magnitude of the problem is one thing, being able to measure the pathway is mission critical. Little more than one per cent of 5,000 large companies globally are making substantial disclosures of their climate risks, while more than half are not reporting them at all, according to ESG data and research by Arabesque. Only 1.2% of the companies reported on all 11 recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) in 2019, and 54% of the top firms failed to make any disclosures.

The lack of timely, accurate and complete climate and forward-looking ESG data is a major challenge for investors, although the situation is improving. A key outcome of COP26 was the establishment of a new International Sustainability Standards Board (ISSB) to develop a global baseline for disclosure standards on climate and other ESG matters. Together with new technology-driven initiatives such as ESG Book<sup>1</sup>, a digital platform for accessible, comparable and transparent ESG data, the landscape is changing.

We still have a long way to go before corporate climate disclosure reaches levels that are now being demanded by investors, and while the data we have may be imperfect, that should not stop us from building effective strategies that utilize modern technologies, together with large amounts of auxiliary data in order to create dynamic models that can adapt to changing environments.

This article will outline how to build robust and effective climate pathway strategies using (imperfect) ESG data, analytics, and create technology-generating active market returns in our collective race to Net-Zero. Quite simply, there is no time to wait.

1. [www.esgbook.com](http://www.esgbook.com)

## How to invest *Green*?

ESG has rapidly become a household term over recent years, leading to confusion about what it means and creating unrealistic expectations about its effects (Serafeim, 2021). Concerns about greenwashing are on the rise, as is criticism around whether green investing is even working (The Economist, 2021). Some of this criticism may be due to lack of understanding of the basic nature of ESG, which has remained unchanged ever since the concept was first coined in 2004<sup>2</sup>. It is a transient phenomenon that tries to come to grips with the massive transformation societies and markets are currently undergoing, as shown below in figure 1. ESG investing will remain relevant so long as current price signals and regulation do not fully capture the true costs and benefits of what is yet to come. It is not a panacea that will solve “the tragedy of the commons or the horizon” by itself. ESG investment requires coordinated global effort from policymakers, regulators, corporates, investors and consumers - a tall order in a G-Zero world<sup>3</sup> with rising populism and geopolitical tensions dealing with global challenges.

### Business Transformation

	Industrial Era	Future Fit
Strategy	Profit, Scale, Analogue	Purpose, Speed, Digital
Organisation	Hierarchic, Rigid, Limited Disclosure	Network, Agile, Transparent
Human Resources	Labour as a Cost	HR as Intangible Asset
Natural Resources	A Cost Factor	Good Stewardship
Policy/Society	Defensive, Compliance Optimisation	Corporate Statesmanship
Energy Supply	Fossil Fuels	Clean Electricity

Figure 1. Business Transformation to a Future-Fit world

2. [https://www.unepfi.org/fileadmin/events/2004/stocks/who\\_cares\\_wins\\_global\\_compact\\_2004.pdf](https://www.unepfi.org/fileadmin/events/2004/stocks/who_cares_wins_global_compact_2004.pdf)

3. [www.gzeromedia.com/gzero-world-with-ian-bremmer](http://www.gzeromedia.com/gzero-world-with-ian-bremmer)

Let's start to untangle what ESG investing is about. It goes beyond the traditional two-dimensional risk/return analysis defined in a narrow financial context ignoring externalities, ethics, and values. We have forgotten about the Theory of Moral Sentiments written in 1759 by Adam Smith, and got carried away with Milton Friedman's dogma "The Social Responsibility of Business is to Increase its Profits", so long as it stays within the rules of the game (Friedman, 1970). However, the rules of the game are changing, and it is time to let go of Milton Friedman (Ruggie, 2020).

As explained by Mark Carney (2021), markets don't exist in a vacuum, and effectiveness is determined partly by the rules of the state and partly by the values of society. If left unattended, they will corrode those values. We are learning the hard way that ignoring planetary boundaries creates transition and physical risk, in turn impacting returns and more importantly, our planet and society as a whole. That is why we need to introduce two more dimensions into the investment process: Values and Outcome (or Impact<sup>4</sup>), as depicted in figure 2 below. The four dimensions of sustainable investing are fully integrated and actively supported by engagement and proxy voting to drive change towards future-fit. This approach can also be applied in building a climate investment strategy.

### The Four Dimensions of Sustainable Investing

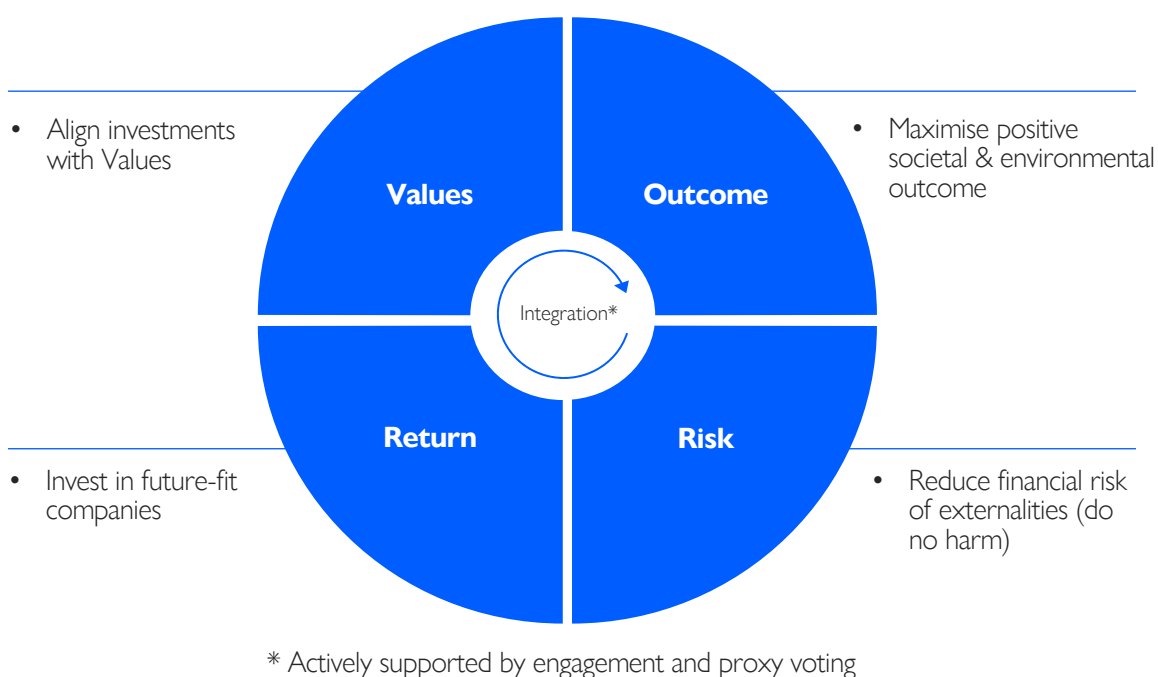


Figure 2. The Four Dimensions of Sustainable Investing

4. Outcomes tell us the change in objective terms that has occurred as a result of a planned intervention. Impact tells the story, experiences, and/or feelings of people or society, as a result of the change (Google).

As shown in figure 3 below, based on their Values, Outcome, Risk and Return objectives, investors apply ESG data and analytics to build the investable climate universe as the first step. This is a dynamic and iterative process due to changes in underlying data and analytics. In the early days of ESG, universe construction used to constitute simple exclusions based on single aggregated ratings such as removal of the bottom 25% of an ESG Score. As data has subsequently advanced, universes can be constructed to target specific themes and sustainability objectives which go beyond the simple exclusionary approaches.

## Creating a Targeted and Customisable Climate Investment Universe

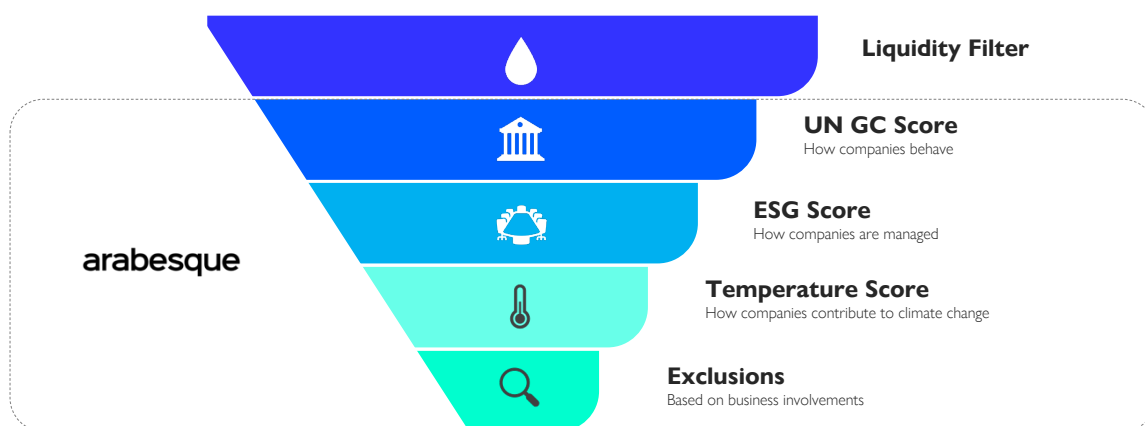


Figure 3. Creating a Targeted and Customisable Climate Investment Universe

### Thematic or core strategy?

Many of the early climate strategies were limited to the specialist skills of traditional active managers, given the lack of data and standardised reporting on climate issues. These emanated in the form of narrowly defined thematic strategies with high sector and style concentration chasing the 'alpha' associated with the transition. Whilst these strategies have their place in the market, there are now alternative options. Instead of climate investing at the fringes, the creation of a globally diversified core strategy that integrates climate risk and achieves real-world emissions reductions is more impactful.

### Passive or active?

Following a purely passive strategy leaves investors with only engagement and proxy voting as tools for change. It's hard to reconcile this strategy with climate Value and Outcome objectives fully, although this approach is favoured by many institutional investors based on their cost considerations and delivering a market return (avoiding underperformance).

However, it begs the question whether the investor is a future maker or future taker. Or simply put, a leader or a follower. Clearly, that question can only be answered by the owners of capital, or their fiduciaries trusted with managing their savings. An active (or rule-based) climate strategy does not compromise investment objectives and if managed by a technologized investor (Monk & Rook, 2020) it can deliver the best of both worlds: link sustainable investing with market returns as explained below.

## Traditional or technologized investing?

A new dawn for asset managers is now emerging. Financial technology today makes it possible to capture hidden information, analyse large datasets, identify complex, non-linear relationships, and reduce human biases and errors. AI can automatically adapt to dynamically changing markets. And as a result, active sustainable investing becomes scalable, hyper-customisable to cater for the four dimensions of sustainable investing, and cost-effective.

AI 'machines' will also increasingly detect greenwashing. It will become easier in the coming years to determine if the so-called sustainable emperor has no clothes. Big Data, AI, Deep Learning, and Natural Language Processing will make it almost impossible for companies to pretend to be green. Additionally, regulatory developments such as EU Sustainable Finance Disclosure Regulation will also reduce the risk of greenwashing and improve disclosure.

## FinTech Transformation

Traditional	Technologized
Financial Data	Big Data
Local IT Stack	SaaS/Cloud/API
Linear	Exponential
Limited Choice/Bulk	Hyper customizable
Statistics	AI, Deep Learning, NLP
Manual	Autonomous

Figure 4. FinTech Transformation in Asset Management



## Filling the data gaps

As the old computer science saying goes, 'garbage in, garbage out'. Fewer places is this more fitting than in systematic ESG investing. A recent survey by Robeco found that 58% of European investors cited insufficient data as the biggest obstacle for climate investing<sup>5</sup>. Not only is the lack of data an issue, but an abundance of data can also be problematic for investors. A landmark paper from Christensen, Serafeim and Sikochi (2021) shows that the more ESG disclosure there is from a company, the larger the dispersion in its ESG rating between providers. They put this down to the notion that the evaluation of outcomes is more subjective than the evaluation of inputs, which implies there may be more agreement the closer one moves to the underlying raw data point. For instance, it is much easier to determine what is 'good' versus 'bad' ESG when considering a company's carbon emissions versus an aggregated environmental assessment across all environmental dimensions.

Taking carbon emissions data a bit further, given its relevance to climate investing in general, exposes yet another data nuance investors should be wary of. Given the enormous demand for carbon data in the global investment community, many ESG data vendors provide emission estimates for companies that don't disclose, for example an industry average. Whilst this solves reporting requirements for investment holdings across asset classes and geographies, it does not reflect reality. Companies that don't disclose emission data are usually laggards for a reason. Estimation also creates a disincentive for any business with emissions worse than their estimate to report the true value. This is further compounded by many of the worst emitters being located in Emerging Markets where disclosure tends to be worse<sup>6</sup>.

**“Given the enormous demand for carbon data in the global investment community, many ESG data vendors provide emission estimates for companies that don't disclose. Whilst this solves reporting requirements for investment holdings across asset classes and geographies, it does not reflect reality.”**

We therefore believe that using 'next-best' data including other assessments of a company's environmental footprint is better than using estimates. For example, in our universe construction, where companies don't report carbon emission data and thereby have no resulting scores (e.g., Temperature Score), we fall back on an array of other environmental data points as suitable proxies for a company's climate impact. For example, a company's environmental management or how it contributes to renewable technology. We find this to be a more tangible way of constructing desirable investment universes that have real-world impact. The process can be seen in Figure 3. Instead of relying on broad ESG scores, we delve deep into the underlying environmental data that feeds into the headline scores when narrowing our investment opportunity set.

[5.https://www.robeco.com/uk/sustainability/climate-investing/challenge/](https://www.robeco.com/uk/sustainability/climate-investing/challenge/)

6. Of MSCI ACWI constituents 59.8% of DM companies have reported scope 1 and scope 2 emissions at some point over the past 2 years versus 30.2% of EM companies. Source: Arabesque Asset Management

## Net-zero means reducing emissions globally, not just in the portfolio

In what is still a relatively nascent space, the current climate solutions on offer in the industry vary significantly, though they can be categorised through one of the four dimensions in Figure 2. However, it is important to make the distinction between strategies that mitigate the financial impact of climate transition and physical risk occurring over a time horizon, and strategies that actively contribute to the reduction of global emissions. These would sit on the ‘Outcome’ and ‘Risk’ dimensions, respectively, in Figure 2.

Mitigation-based strategies (Risk) typically involve a divestment-based exclusion from heavy asset sectors such as Utilities and Energy that contribute the bulk of Scope 1 carbon emissions. This is supported by evidence from Bolton & Kacperczyk (2020), who find that amongst institutional investors, divestment is statistically significant only on scope 1 emissions intensity (i.e., at the industry level), and once the worst emitting sectors are removed, there is no significant divestment effect at all. In other words, institutional investors don’t yet seem to care about emissions in sectors outside of energy production, even if this is where the bulk of scope 2 and scope 3 emissions lie. Simple divestment can result in a portfolio with very attractive carbon credentials and reduced carbon risk in the portfolio.

However, this approach comes with two complications. Firstly, investors take the ‘not my problem’ approach here to those companies most in need of change by starving them of capital and relinquishing active ownership responsibility, perhaps to less climate-motivated investors. Secondly, some of these businesses have vital infrastructure that will still be required towards a Net-Zero world, such as energy storage capacity. We argue that these are not climate Net-Zero investment strategies, but are instead investment strategies managing climate risk – a subtle but important difference.

Effective climate (outcome-based) strategies take a different approach by investing in opportunities associated with the transition to a Net-Zero world targeting reductions in real-world carbon emissions. They typically hold concentrated portfolios in niche corners of the market, such as alternative energy production. They often have significant portfolio-level carbon intensity and footprinting metrics given the type of companies they invest in, but report on measurements such as carbon avoided and year-on-year decarbonisation reductions. These strategies are also exposed to greater idiosyncratic risk from an investment perspective given their concentrated holdings and single-themed nature<sup>7</sup>. However, they do allow investors to facilitate change through productive engagement across businesses that need to change the most.

**“In what is still a relatively nascent space, the current climate solutions on offer in the industry vary significantly.”**



<sup>7</sup> <https://www.ft.com/content/81e04951-b91b-4f40-9253-ebf1bcea18ea>



## How do we piece it all together?

At Arabesque, we have constructed a global approach derived from much of the EU Sustainable Finance Disclosure Regulation (SFDR). Our process allocates businesses into respective roles, solution providers, Paris-Aligned and Non-disclosers, for the climate transition with the goal of tackling the issues we highlighted above. Climate change is a systemic risk affecting all industries, and accordingly, our approach doesn't skew into niche corners of the market. At the broadest level, it allows us to create globally diversified active climate Net-Zero pathway strategies directly contributing to the goals set out in the 2015 Paris Agreement, and to hold companies to account for nearer-term climate targets in 2030 as opposed to back-loaded Net-Zero commitments by 2050<sup>8</sup>.

Companies in our process can be categorised into three non-mutually exclusive groups.

**1. Solution providers** – these are the companies that many of the first thematic climate funds target and are those associated with opportunities arising from the transition. For example, companies innovating in alternative energy production such as wind or solar. The key differential in our approach is that by leveraging ESG data and analytics, we can identify companies across all industries that are striving to improve energy efficiency, not just those sectors involved in energy production.

**2. Paris-aligned** – companies that have independently reviewed transition pathways in line with the 2015 Paris Agreement, or those that are decarbonising at a minimum rate of 7% per year. This grouping seeks to reward those 'normal' companies that are making significant efforts to improve the climate credentials of their business model.

**3. Non-disclosers** – companies that don't report carbon emission data but can be assessed across other environmental dimensions such as waste or resource efficiency. We favour relying on tangible ESG data points in determining a company's climate impact as opposed to estimates. Thinking broadly about each companies' role in the climate transition allows us to customise strategies to specific climate targets. For example, a niche solution providers-based strategy in energy-intensive sectors or, as we have done at Arabesque, a globally diversified strategy that targets companies providing solutions across sectors as well as those businesses on their journey to a future-fit decarbonised economy.

Thinking broadly about each companies' role in the climate transition allows us to customise strategies to specific climate targets. For example, a niche solution providers-based strategy in energy-intensive sectors or, as we have done at Arabesque, a globally diversified strategy that targets companies providing solutions across sectors as well as those businesses on their journey to a future-fit decarbonised economy.

8. A wise man once pledged to give up beer by 2050: <https://mronline.org/2021/11/09/>

## Conclusion – a call to action

The Glasgow Financial Alliance to Net Zero (GFANZ) announced on 3 November 2021 that “over \$130 trillion of private capital is committed to transforming the economy for Net-Zero. These commitments, from over 450 firms across 45 countries, can deliver the estimated \$100 trillion of finance needed for net zero over the next three decades”.

We strongly support the GFANZ pledge, and the commitments made at COP26. However, we still do not see enough action towards implementation. Divesting from fossil fuels can be a great Values-based decision, signalling climate awareness and reducing climate transition risk. And yet, this does not lead by itself to a Net-Zero economy. Investing in future-fit companies who are actively transitioning in a measurable way through a Paris-aligned pathway, or are providing solutions towards this goal, can drive real change. Meanwhile, corporations that continue to wilfully resist climate action will ultimately lose their license to operate in a changing world where capital allocation becomes increasingly conditional. Indeed, their societal contracts will end.

Sustainability, technology and markets momentum is leading to a profound transformation for corporations and investors. It is time to rethink how markets integrate ESG<sup>9</sup> and how we can drive necessary changes in the real economy toward decarbonisation.

The race to Net-Zero is on. Are you joining?

9. Bril, H., Kell, G., Rasche, A., Sustainability, Technology and Finance: Rethinking how market integrate ESG. Routledge, forthcoming

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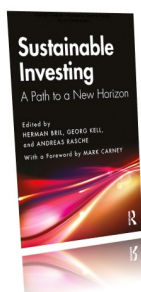
## Allocating capital to address climate change represents a great investment opportunity

“

A transition to net zero will affect how risk is measured and managed, and how assets are valued. [...]

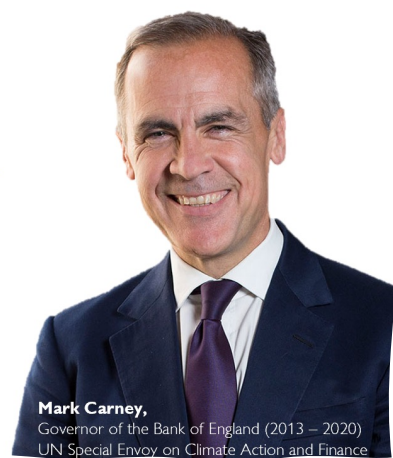
The transition to net-zero is creating the greatest commercial opportunity of our age. ”

### Foreword by Mark Carney



### **Sustainable Investing: A Path to a New Horizon** (Routledge, September 2020)

By Herman Bril, Georg Kell, and Andreas Rasche



**Mark Carney,**  
Governor of the Bank of England (2013 – 2020)  
UN Special Envoy on Climate Action and Finance