ROBECO
The Investment Engineers

Quantifying sustainability

WHO WE ARE, WHAT WE DO, AND WHY WE DO IT

MEET THE INVESTMENT ENGINEERS

Sustainable Investing Expertise by
ROBECOSAM

This book is a journey. A journey along countries and continents. But above all, a journey along the heart. It contains portraits of people trying to make the world a little better. Men and women dedicated to the cause of sustainable investing. They talk about what worries them, and what drives them. About their children – our next generation.

Meet the investment engineers.

But what can an engineer do without decent tools? This is also a book about the numbers and data behind the stories of our time. It's about making the challenges of our planet understandable and tangible. It's about ESG integration, SDGs, climate and biodiversity, dilemmas and data.

It is about *quantifying* sustainability.

In this book, these two worlds don't just meet.
They embrace each other.

March 2023

Contents

“ *I have never tried that before, so I think I should definitely be able to do that.*

Pippi Longstocking

Hannah, 17 years old, daughter of Masja Zandbergen-Albers

Masja Zandbergen-Albers
Head of Sustainability Integration

It's worth fighting for what you believe in

ROTTERDAM (51°55'21"N, 4°28'45.01"E) - When you think Masja Zandbergen, you think ESG integration. Long before sustainable investing (SI) went mainstream, she was convinced that, as an investor, you had to include sustainable criteria in your research.

"It's part of an investor's job to want to know how sustainable a company is, and what impact that has on its future, and to actively act on what you've learned," she argues. "I've never wanted to invest in a company where the working conditions are poor."

Call her opinionated; call her stubborn. But Masja is used to fighting for what she believes in: that sustainable is the way forward. "I am stubborn, yes. Always have been. I say what I think."

The same goes for her daughter, Hannah. Those coming of age now have plenty of challenges on their plate – keeping the world livable, and addressing, for example, inequality. But the younger version of Masja belongs to that part of the up-and-coming generation that knows what it wants. Take the fact that she's been a vegetarian for about four years, simply because she learned how much water it takes to produce one kilogram of meat.

But Hannah is also critical about the clothing and accessories she buys – and where she buys them. She prefers to score the rare, second-hand vintage find than bag a brand new garment each month from a cheap fashion chain, where it's far from clear whether the workers, often in low-wage countries, are being paid a fair wage.

For Masja, it's an example of killing two birds with one stone: you have quality at a lower price and you contribute less to consumerism.

On ESG integration

"You really have to integrate sustainability, otherwise it doesn't make sense. Just like you have to change the system from the inside out." But that system doesn't let itself be changed easily. You've got to be in for the long haul. And that requires leadership with a sustainable vision.

"As an asset manager, you need motivated people within the organization who are supported from the top." Back in 2004, Masja was an early proponent of 'voting & engagement' – sustainability *after* the investment process – but in 2023, everything is different. ESG integration is now deeply rooted in the investment research.

"I truly believe we're far ahead of the competition when it comes to sustainability integration of financial material issues. As an investor, that's something you clearly just want. It's smart. It gives you a knowledge advantage that can lead to the generation of alpha."

But, ideally, investors will also look at non-financially material aspects of companies that could be improved, Masja believes. "I'm convinced that in the really long term, a sustainable company is also a better investment. But we can't prove this 100% conclusively. Yet. And that long term is generally longer than the investment horizon."

On making the world a better place

And then there's that eternal dilemma. Despite all these good intentions, at the end of the day it's all about returns. "Asset managers aren't actually there to make the world a better place, but we do direct the money flows. The reality is that asset managers do generally navigate on outperformance, AuM and, all right then, a little sustainability."

"Our customers are like that, too. And perhaps it's true, that it doesn't fit within our role. In the industry, you always have that discussion: whether making the world a better place fits within the fiduciary mandate. I believe that it is possible to do both: invest well while following your own principles. And we already do that partly, at Robeco: investing for wealth and well-being. Biodiversity, climate, human rights – we're now trying to include all of that in our bottom-up investment research."

On knowledge advantage and knowledge sharing

Hard work. Research. A scientific approach to sustainability. It's all paid off. As a pioneer and leader in sustainability, Robeco has the wind at its back. But that's no reason for complacency. With great power comes great responsibility. And it can also pay off to bring others in your wake: sometimes to divide is to multiply.

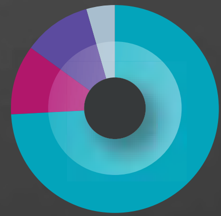
Especially when you share knowledge. "We have developed an SDG framework, giving companies scores based on their contribution to the Sustainable Development Goals (SDGs). I think it's one of the best frameworks out there. But what if clients want to gear their entire portfolio toward the SDGs? Then there's not much they can do with those scores of ours, because they only cover our portfolios."

"If you want to enable your clients to manage their entire portfolio based on our unique SDG framework, you need to open it up. We've done this through our Open Access initiative, where clients and academics can gain insight into research that until recently was exclusive. This is how we can get feedback on how we measure and rank companies, and continue to improve our research."

"We have to deal with competitors in our industry, but in the area of sustainability, we actually work together on many fronts, because only together can you achieve anything. Another thing: we have hundreds of customer meetings a year, but in 2022, 57% of those meetings were purely for knowledge sharing."

Quantifying sustainability: It's about integration and education

We offer clients a broad range of sustainable investment solutions. We divide our strategies into three different types, depending on the sustainability objectives they have. First, there's Sustainability Inside. These strategies incorporate full ESG integration, the use of proprietary research, exclusions, voting and engagement. Then there's Sustainability Focused. These strategies have additional sustainability components added, such as more stringent sustainability goals and targets. Finally there's Impact Aligned. Here we aim to make a measurable impact on society as well as deliver financial returns, such as by targeting the Sustainable Development Goals.

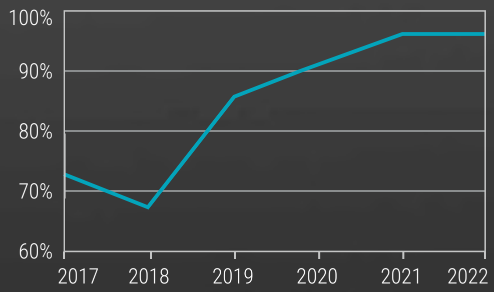


AuM in ESG integrated assets
(EUR, bln)

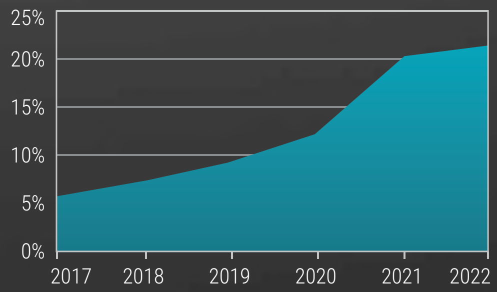
Sustainability Inside	127.0
Sustainability Focused	18.7
Impact Aligned	18.1
Other	7.3

96% of Robeco's assets under management (AuM) is now in ESG-integrated assets. This number has grown significantly over the past few years. The share of AuM in Sustainability Focused and Impact Aligned has also risen to more than 20%.

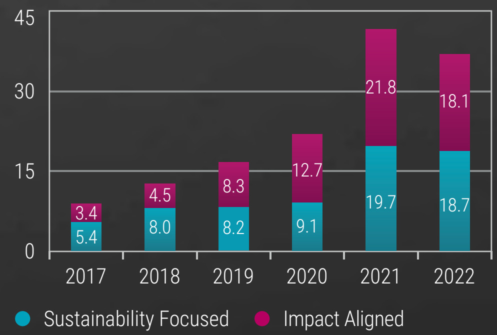
% AuM in ESG-integrated assets



% AuM in Sustainability Focused and Impact Aligned



AuM in Sustainability Focused and Impact Aligned
(EUR, bln)



Open Acces Initiative
As a thought leader in sustainable investing we are committed to education on the topic of SDGs. Therefore we have given access to our SDG research database to 600 clients and 60 academics. With their feedback we can further improve our models. In our SDG Framework we score more than 10,000 companies based on their SDG contribution.

600
clients have access to the portal

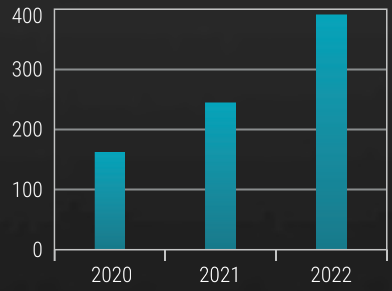
60
academics, globally, have access

11,948
companies are scored in the SDG framework

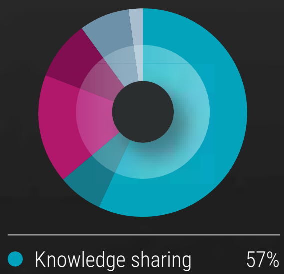
Source: Robeco, figures as of March 2023

The number of meetings with clients on an annual basis shows a steep incline. More notably, the topics we discuss with clients have moved away from pitches to knowledge sharing. As a thought leader in sustainable investing Robeco is committed to education around the topic of sustainable investing.

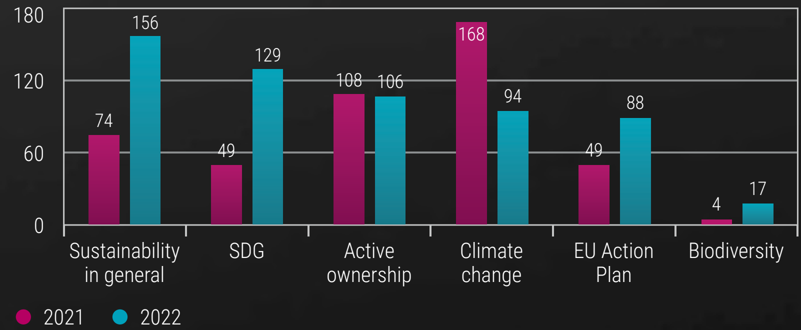
Number of meetings still rising over time



More than half of client meetings is now knowledge sharing



Topics we discuss with clients: SDGs on the rise



For all other figures on this page:
Source: Robeco, 31 December 2022

> “ *Simplicity is the ultimate sophistication.*
>
> Leonardo da Vinci

Lucas, 12 years old, son of Lucian Peppelenbos

perspective

It's no use navigating on yesterday's wind

ROTTERDAM (51°55'21"N, 4°28'45.01"E) - He has the passion and intensity of his Brazilian mother and the reflectiveness of his Dutch father. Lucas lives very fully, with the accompanying ups and downs and the passionate emotions of his parents. He is always, in anyone's company, really present.

And he is also a thinker. Someone who keeps on asking questions *ad nauseam*, because he wants to understand, fathom things. Because his brain never shuts down and his curiosity is never satisfied. Two personalities coming together in one body. A firebrand and a thinker; someone who expresses his spontaneity and passion in a thoughtful way. A teenager reflecting on the adult world. On politics in Brazil. And on climate change.

"When we are on vacation in nature, he says this is what it's about, and not *what a beautiful view*," says his father, Lucian Peppelenbos. Not surprising, perhaps, with a dad who's a climate strategist. But what Lucas hears at home resonates with him.

Firebrand isn't a label you'd naturally apply to Lucian. Always calm, thoughtful. Every word comes out measured; almost slowly. Never a sentence that contains unnecessary words. And just as every word fits into every sentence, Lucian's every observation fits into a bigger picture.

"I keep track, think, and then come up with an insight or conclusion to move a situation forward. At work, at home, with friends." He often feels as though he's one step ahead of the others. "That might come across as arrogant, but it's more a question of what my role often is in a bigger process."

Lucian Peppelenbos
Climate & Biodiversity Strategist

On complexity and making things tangible

The topic of climate is incredibly complicated. It helps to break it down, in steps, so that something can actually be done. "I work on very complex things for which science is also evolving, and where you could really question all the knowledge available." And Lucian is trying to translate that mass of potential and uncertainty into something a portfolio manager or the active ownership team can actually do something with.

"In this way, you create perspective and you can chart a course. You enable others to make headway." This is less simple than it sounds. "I can spend my entire time on the first step alone: seeing what's happening and then not getting around to translating it into insight or action."

On two sciences meeting

"You have investment management with its own research and science, and you have climate, with the natural sciences. Attempts to connect those worlds often get stuck at an abstract level. If you really want to change something, you have to make it concrete. Otherwise you just get hung up on semantics."

The question is, where do we stand in 2023 on that connection? "If you ask: where are we at in the journey towards net-zero emissions, the answer is that we're just getting started. But in terms of knowledge, we are well on our way. We have a clear path and strategy. And we have the analytics to make good choices at the portfolio level."

Many investors focus on the carbon emissions companies report, according to Lucian. But that's charting a course based on yesterday's wind. "You have to be able to assess how companies are responding to the transition. Whether their capex reflects this. What does their strategy look like? And very specifically, what emissions do they expect in the future? We are all setting that up. This gives our investors a concrete tool with which to anticipate the climate transition."

That's something Robeco excels at, says Lucian. The data is now being automated and it is expected that by the end of 2023 these forecasted emissions will have been mapped out for 70% of the investment universe.

"That's how you identify companies that are prepared and those that aren't for the big transition – the risks and the opportunities, in other words. But our Global Climate Survey 2023 shows that only 27% of institutional investors are doing something with forward-looking information – and that begs the question about how broad and deep that information actually is."

On climate and the impact on returns

Is climate the theme for investors over the next five or ten years, as a return determinant? More than interest rates, inflation, and central bank policy?

"You do see it slowly being priced in. But we are only at the beginning of real transition policies and the costs involved, 'greenflation'. And nothing suggests the transition is going to be particularly smooth. We need to consider disruptions that are going to impact future returns. Not as a separate factor, but as an amplifier."

Those disruption scenarios, he points out, incidentally also apply to food supply, land use and natural resources. Those will all undergo drastic changes. Because in the end, everything is related. Lucian deftly bypasses all the big words in that argument – thoughtfully, without switching into panic mode.

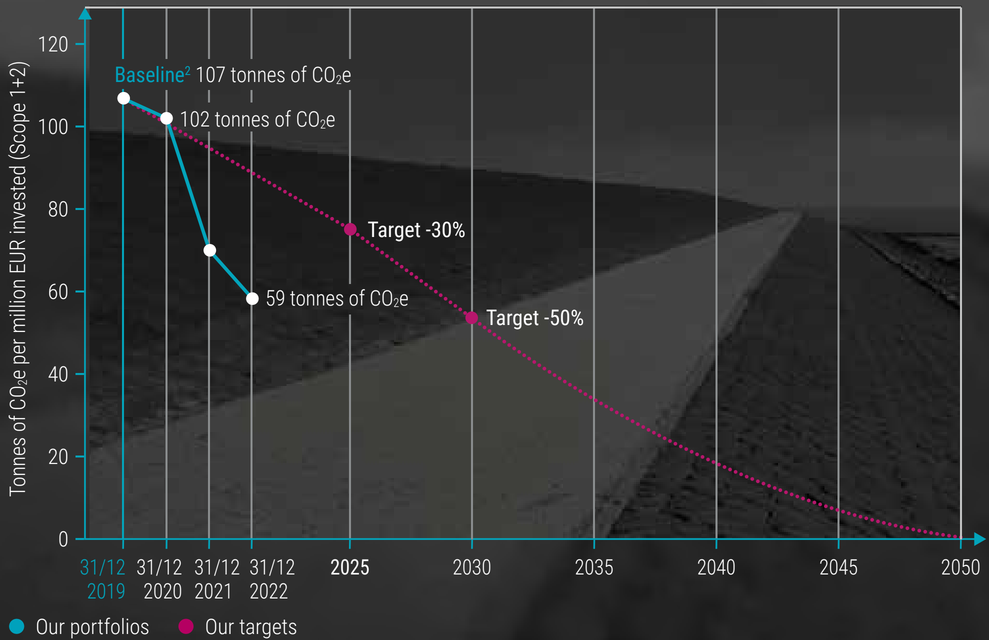
"I am not an activist. I am not an idealist. But we need to realize our economy and society are part of a biosphere that is subject to certain natural laws, which now show that there are great risks built in. But that also comes with huge opportunities for companies who know how to solve the problems our society faces."

Quantifying sustainability: The only way is... down

Our net-zero strategy focuses on contributing to emission reduction in the real economy. Simply divesting from high-carbon assets means that these will appear in another portfolio without any lasting impact in the real world. For the net-zero transition to be successful, it is exactly the high-emitting sectors that require the most capital to transform. Our role as investors is not only to invest in that transition, but also to accelerate it.

Decarbonizing our portfolios

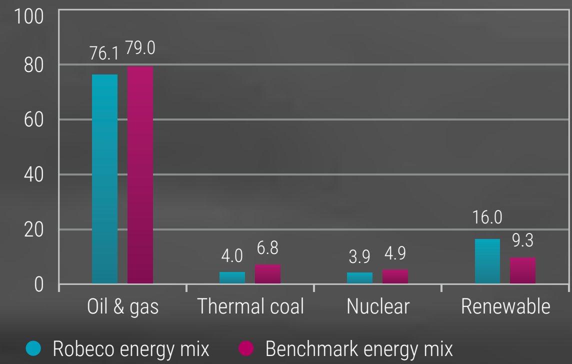
Our decarbonization targets[1] are -30% by 2025 and -50% by 2030, both relative to 2019. This means that we will follow a trajectory of 7% decarbonization year on year for aligning our investments with the goals of the Paris Agreement.



1. The scope of our decarbonization target is corporate equity and bonds in Robeco strategies. This is approximately 40% of total AuM. The underlying rationale for this limited scope, and our approach to expanding the scope, are explained in our Net-Zero Roadmap.
2. In accordance with our net-zero methodology and applicable industry standards and legislative guidance, our 2019 baseline has been adjusted for the inflation of EVIC (Enterprise Value Including Cash) by correcting for the average EVIC change and for our changing asset mix between 2020 and 2022 by using the asset mix as at 31 December 2022 for all calculations. As a result, the baseline has changed originally 104 to 107 tonnes of CO_2e per million EUR invested.

Energy-mix exposure in %

As at 31 December 2022, Robeco's exposure to energy-related investments was 5.0%. The benchmark's exposure was 6.4%. The exposure to oil & gas is lower than the benchmark, while the exposure to renewable energy is significantly higher than the benchmark.



Source: Robeco. This exposure is expressed as a proportion of the corporate bonds and equities for which we have data on revenue exposure to energy production, generation and supporting practices and services. These securities account for EUR 137.5 billion, or 85.4%, of our assets under management.

Robeco climate traffic light for top 250 emitters in 2022

Our climate traffic light measures how well companies are managing their transition to net zero. We keep track of the top 250 emitters in our investment universe. We see robust transition strategies amongst 27% of companies, while 21% are working on it, and 52% are not doing enough. The latter group is where we focus our engagement and where we may vote against management.

Aligned	8%
Aligning	19%
Partially aligning	21%
Misaligned	52%

Stewardship on climate-related issues (2022)

156

Votes against management at 156 companies for showing insufficient climate performance.

68%

Votes against 68% of company climate transition plans ('say on climate') for not meeting our requirements.

80%

Votes in support of 80% of climate-related shareholder resolutions.

56 >20%

A total of 56 companies under climate engagement (>20% of our portfolio carbon footprint).

Climate-aligned investing

308

Companies excluded from investment strategies based on climate-related criteria (coal power expansion, arctic drilling, oil sands, thermal coal, and climate traffic light).

For all figures on this page:
Source: Robeco, March 2023

> “ *Working hard for something we don’t care about is called stress. Working hard for something we love is called passion.*
>
> Simon Sinek

Rafael, 10 years old, son of Daniela da Costa-Bulthuis

passion

One of the greatest balancing acts of our time

ROTTERDAM (51°55'21"N, 4°28'45.01"E) - Passion flows through her veins by default. When Daniela da Costa talks, she talks a lot; with sparkling eyes, and hands that never rest quietly on the table. She's full of enthusiasm, just like she approaches her work. "A new challenge? Count me in."

But the most important thing is the chance to mean something. "Since having children, I've wanted to make the world a better place. It's not my world, but the world they live in." Her job isn't about speculating whether a company's stock price will rise, but about investing in companies that make a positive contribution to the world.

As she says in her own words, it doesn't do it for Daniela when she makes a return on an investment in a bad company. What about generating alpha? It's an inseparable part of the profession, but 'winning' for her is more about progress.

Daniela's son Rafael loves to compete. To win, in particular. Kickboxing, tennis, football. He's always open to learning new things. And he has a lot of energy – something that runs in the family. The son of a Brazilian mother and a Dutch father, he also has another, quiet side, and is, as Daniela calls it, "a child of my transition," born just after she came to the Netherlands. That's why, of the three children, he is perhaps the most of a mix.

One passion mother and son have in common: a deep-seated love for the red and black of Flamengo FC, the iconic football club from Rio de Janeiro, whose shirt was once worn by legends such as Zico and Ronaldinho.

Daniela da Costa-Bulthuis
Portfolio Manager & Country Specialist

On the hard investment world and romance

Is Daniela's basic attitude too romantic? Or even a tad naive? Well, it's contradictory, she admits. But not all clients are purely about returns. Many investors are looking to combine returns with a positive contribution to ESG factors. That's the great balancing act for modern investors: contributing to a better world without sacrificing profitability.

"More and more investors hope for that. I just don't want to invest in companies that harm people or the environment. I believe very strongly that sustainable investing (SI) is the only way. I know that I'm too radical sometimes, but that's why I'm involved in impact products."

"I have difficulties in investing in oil companies. You can have companies like that in your portfolio, but you'll get a headache about it every day – even though we have an active dialogue with them to get them on a more sustainable track." Daniela's passion lies much more in investing in infrastructure, health care or education. Not in fossil fuels or beef producers. "It's a constant struggle. But when we decide to invest in such companies, I'm there the next day at the desk of our active ownership team, with an engagement request."

On data and other challenges

Building a sustainable portfolio is a challenge in itself. But measuring impact is also generally seen as a beast of a job, although more and more data is becoming available. Finding sustainable companies in the spectrum of emerging markets is right up Daniela's street. There are in fact countless companies with good sustainable ideas, but what's often lacking is structure, good processes and reporting and KPIs.

"There's enormous potential. But you have to know where to look. Analysts covering commodity-producing regions such as Africa or Latin America, have to look into several listed mining companies, basic materials, oil, food & beverage companies, as those are usually the biggest companies in those markers. These aren't exactly sustainable industries, and most investors do simply invest in them. They are also very profitable businesses."

If you exclude these companies, sooner or later you'll face the risk of underperformance – that's the ongoing challenge. "It's the sectors with a better ESG profile, such as consumer goods, that are expensively valued in some emerging markets countries like Brazil, while commodities are attractively priced."

On dilemmas

"We have incredible internal SI capabilities. And I use literally everything. I'm on all the sustainability committees, knocking on every door." That's not because she knows it all; on the contrary, it's because she wants to learn. "They are all specialists, PhDs. I don't argue with them, I want their knowledge. I'm like a sponge that soaks up everything." Daniela has a direct line to active ownership in particular. It helps her stick to what she calls her 'romantic' view of investing. Practice is always a bit more unruly, and most of all less black and white than is often thought. The life of a sustainable investor is full of dilemmas and it's often a matter of balancing pluses and minuses.

"But our emerging markets strategies already make a positive contribution to the SDGs." The shortest route to that is through the financial industry. Banks contribute to SDGs on poverty, economic growth and infrastructure. But, paradoxically, positive contributions can also be made through the commodities sector.

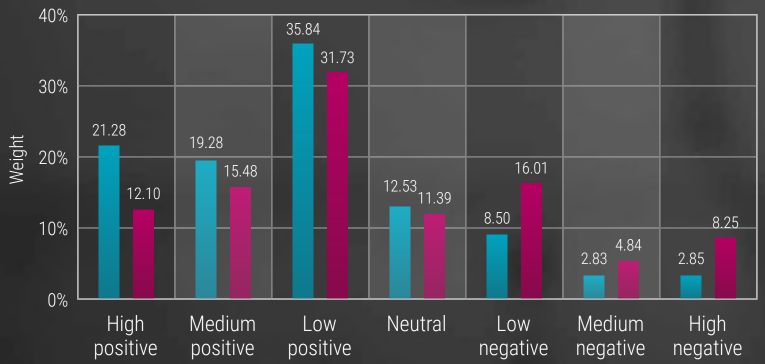
"Not all commodities are bad. Some ultimately contribute to a more sustainable future. Consider lithium mining, which ultimately leads to sustainable solutions. Or cement or steel. Because without cement and steel, you can't build bridges or decent infrastructure that are needed to facilitate sustainable growth."

There's no lack of dilemmas. Chinese companies, which are the world's largest suppliers of solar panels but have problems with labor practices in their operations and/or suppliers – that's another example. "As an investor, you have to dig deep. But it's a myth that emerging markets strategies automatically invest in polluting companies."

Quantifying sustainability: SDGs offer opportunities in emerging markets

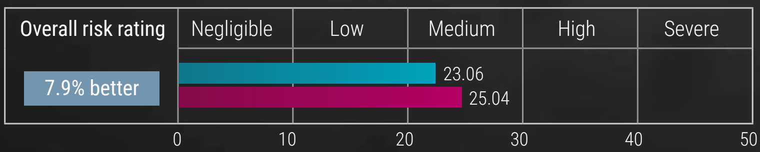
The emerging markets team sees the pursuit of the SDGs as a main opportunity for future product development. Nevertheless, we already have a high positive SDG exposure in our core EM portfolio. Measured via Robeco's SDG Framework, as of February 2023, 76% of the companies in the portfolio have a positive SDG score, versus 59% for the MSCI EM. That is evidence of the opportunity in emerging markets to combine returns with a sustainable future.

SDG Impact Alignment



Strategy MSCI EM index

Sustainalytics ESG Risk Rating
The core Emerging Markets strategy has a sustainability risk of 23, which is considered medium risk by Sustainalytics, scoring 7.9% better than the MSCI Emerging Markets index. In terms of carbon footprint, Trucost data from January 2023 shows that our strategy has a 38% lower carbon footprint than the reference index, if we look at Scope 1, 2 and 3 emissions.



Strategy MSCI EM index

6.6 billion

EM are home to 6.6 bln people (86% of world's population).

USD 2.5 trillion

Attaining SDGs by 2030 will require USD 2.5 trillion of investments in emerging markets.

> 50% EM

More than half of SDG investment opportunities are in EM especially in Food & Agriculture, Health & Well-being and Energy & Materials.

9 out of 10

Of the top 10 cities most vulnerable to climate change, 9 are in EM with the Asian region dominating

Since 2001

Robeco has been looking at sustainability when investing in emerging markets since 2001.

Engagement overview
We encourage good governance and sustainable corporate practices in all companies in our strategy, through voting, (co-)filing shareholder proposals and engagement. Engagement in emerging markets is a great tool to create value by improving the conduct of companies. Today 38% of the holdings in our core EM strategy are under engagement.

Net-zero carbon emissions	3.39%	3	16
Diversity and inclusion	9.24%	1	2
Labor practices in a post-Covid world	0.05%	1	6
Social impact of gaming	1.98%	2	10
Corporate governance standards in Asia	2.29%	2	6
Corporate governance in emerging markets	11.97%	7	35
SDG engagement	6.81%	3	14
Acceleration to Paris	2.42%	4	12

Strategy exposure Number of companies engaged with
Number of activities with companies engaged with

GHG emissions Scope 1 & 2

GHG emissions Scope 1 & 2 tCO$_2$eq/mUSD revenues	Scope 1	Scope 2	16.8% below	The difference is equivalent to the annual CO$_2$ emissions produced by 17 cars per USD 100 mln invested — 17 CARS
Strategy	99.99	33.39	133.38	
MSCI EM index	134.54	25.70	160.24	

Scope 1 Scope 2

GHG emissions Scope 1, 2 & 3

GHG emissions Scope 1, 2 & 3 tCO$_2$eq/mUSD revenues	Scope 1	Scope 2	Scope 3	38.5% below	The difference is equivalent to the annual CO$_2$ emissions produced by 160 cars per USD 100 mln invested — 160 CARS
Strategy	99.99	33.39	276.71	410.99	
MSCI EM index	134.54	25.70	507.96	667.20	

Scope 1 Scope 2 Scope 3

For all figures on this page:
Source: Robeco, March 2023

“ A hug is always the right size.

Winnie the Pooh

kindness

Alexandra Abigail, 10 years old, daughter of Mike Chen

Mike Chen
Head of Alternative Alpha Research

Filtering millions of bits of information – each day

BOSTON (42°20'17.3184"N, 71°2'51.2772"W) - Thinking about elbowing your way up the career ladder? Mike Chen advocates a different approach. "There's a lack of kindness in this world. Especially now, where we see so much more polarization in society. We sometimes forget that other people are people too, each with dreams and loved ones. And quickly demonize those with whom you disagree."

Mike Chen's motto: Being kind is smart, long-term behavior. Or, to elaborate slightly, it's possible to be kind without being a doormat, and to be honest and direct without turning into a bully. Chen embraces his role as a mentor to the new generation. "I am now at the point where I can help others build a career as well."

His daughter Alex is one of those kids who pays attention to others. Kind, without expecting anything in return. When she sees others children sitting alone in the schoolyard, she joins them. Or if other children seem to struggle with math, she scoots her chair and helps.

"She hates seeing others sad. Hates conflict too. Even when she's mad at someone, she expresses herself civilly; while some kids her age don't hesitate to use harsh words." Chen argues that you can have integrity by sticking to your principles and still being kind. "But it's important to find that balance – for young and old."

On ‘kind companies’

Do kind companies actually exist? That question brings you into the realm of corporate culture. “As a company, you’re accountable to your shareholders, stakeholders, employees, and the community. That starts at the top of the company, with senior management. If they look after their employees, that lets you keep employee sentiment positive and healthy.”

According to all scientific studies, greater employee satisfaction leads to higher productivity and ultimately higher profitability. And the great thing is: that sentiment is measurable. Especially with today’s technologies, Big Data and AI. “It makes sense to use this in investment models. All else being equal, you’d rather invest in a company where employees are satisfied, than in a company with high levels of dissatisfaction.” Some of that information is publicly available, but some of it is crowdsourced. “This is how we can actually see whether companies have integrity, and see a whole bunch of other stuff too. And we turn all that cool quant stuff into human insights and then apply them to portfolios.”

On how data finds its way into portfolios

Having models and algorithms scour the internet, parsing reports and CEO speeches is one thing, but how does all that data find its way into quant portfolios? “We collect that data, run it through our quant machinery, process it into numerical scores and we take that score back into our investment models, as one of the factors alongside, for example, valuation, sustainability profile, and earnings momentum. It is one of the ingredients of the models used to manage EUR 70 billion of invested assets in quant strategies.”

Sustainable investing starts with data. But company released sustainability data is far from perfect: backward-looking, and usually available only after months of delay. That gap can be filled with alternative data. Sentiment data, as well as information about incidents or scandals.

“You can’t track and process all the news without AI – we’re swimming in a sea of data. Our models collect all that data, from around the world and from all sources: news, the internet, reports from NGOs, government filings about lawsuits or fines – you name it.” Hundreds of thousands, perhaps millions of bits of information a day. All input is filtered and processed into signals. And those signals are put together with traditional data in investment models.

On natural language processing

“We have a lot of experience with natural language processing (NLP). We use that not only to measure sentiment, but also in very different and fascinating ways. With NLP, you can discover what is being talked about before it makes headlines.” When it comes to details, Chen keeps his cards close to his chest.

“Everyone’s talking about valuations, inflation, interest rates, the Russia-Ukraine war. These are familiar themes in the financial markets, but under the radar the new themes are already developing. We are now building the models to bring those on the radar early.”

These models are rapidly becoming more sophisticated. They can also learn to see not only what is said, but also how things are said, by CEOs for example. It’s one thing to have a model scan a text for positive or negative words, but CEOs worldwide, meanwhile, are smart enough to avoid those very words. “But what if your model learns to read all the CEO updates in a smart way? Not just screening texts for words, but reading comprehension and recognizing when the minutes of an annual meeting show that the CEO has given an evasive answer to a question?”

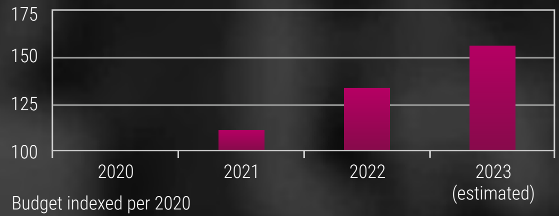
It may even be possible to find financially relevant insights by having audio files analyzed in terms of tone, Chen believes. “CEOs are smart enough to choose the right words. But according to the laws of physiology and psychology, there is a lot of information to be gained from the tone in which things are said.”

The future, as Chen sums it up, is insanely interesting and a tad frightening all at the same time.

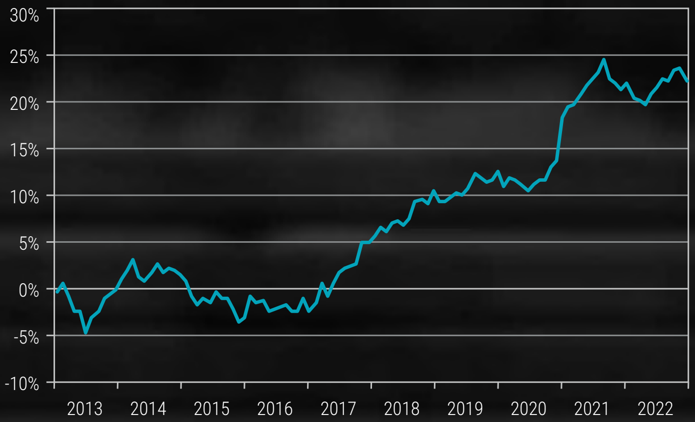
Quantifying sustainability: Don’t worry, buy happy

Harvard Business Review reported a landmark study analyzing more than 3,500 business units with more than 50,000 individuals. Researchers found that acts of courtesy, helping, and praise were related to core goals of organizations. Higher rates of these behaviors were predictive of productivity, efficiency, and lower turnover rates. When leaders and employees act kindly towards each other, they facilitate a culture of collaboration and innovation.

Our budget for alternative data has grown by 56% since 2020



Kindness pays off
Kindness in the organization leads to a happier workforce, and a happy workforce is more productive and ultimately leads to a better stock performance. This chart shows the outperformance of a long-short portfolio (top decile minus the bottom decile) of listed companies, ranked on employee sentiment. Buy the happy companies, sell the unhappy.



Source: Long-short performance of Glassdoor rating; Robeco QI Global Developed Enhanced Index Equities; region-sector neutral, holding period 9 months.

Robeco research confirms that higher employee sentiment leads to more productivity.
To put it simply: you have to pay less to generate the same amount of sales as companies with an unhappy workforce do. And there’s more. People at companies with a high employee satisfaction score often have a higher degree of skills and education (human capital). These companies also find it easier to attract and retain these skilled talents.

Portfolio	Top (high ratings)	Bottom (low ratings)	Top-bottom
Payroll/sales	18.4%	22.5%	-4.1%
Human capital development	70.4	63.0	7.4
Talent attraction & retention	73.2	66.7	6.5

Source: Robeco, 2023

16 types of data

In the quest for alternative data Robeco researched 16 distinctly different types of data over the past 2 years alone, ranging from NGO campaigns to audio files.

5 types of NLP

We use 6 types of machine learning algorithms, and 5 types of natural language processing algorithms.

200 TB of data

All this compounds to a total of 200 TB of data on a daily basis to run our research models. 200 TB of data is the equivalent of 40,000 DVDs – or 60 billion pages of text.

35,000 CPU/h

Three years ago Robeco used 10,000 CPU/hour to compute the alpha optimization. That number has increased to 35,000 CPU/hour at the beginning of 2023. It takes 1 CPU/hour to play the full blast version of the World of Warcraft game. Running our model is like playing 35,000 of these games simultaneously.

For all other figures on this page:
Source: Robeco, 31 December 2022

In 2015 the United Nations adopted the 17 Sustainable Development Goals (SDGs). For the first time in history, the world has a shared plan for promoting sustainable economic growth, advancing social inclusion, and safeguarding the natural environment. All countries have agreed to work towards achieving the 17 SDGs by 2030. The 'call to action' that lies at the heart of the 17 goals is aimed at the whole of society. It presents both a challenge and an opportunity, for businesses and investors, both of whom are seen as key to achieving the goals.

The Robeco SDG Framework

Four reasons why the SDGs are relevant to investors

SDG investing is about impact investing. This differs from ESG integration, which focuses on avoiding financial risks that stem from poor performance on environmental, social and governance issues. SDG scores can identify which companies are expected to have significant negative impact and which ones can or will provide sustainable solutions.

1 Investors indicate that they want to align their investments with the SDG goals, now and in the future, with 18% saying they had made it a high priority. A further 40% said they would consider doing so over the next two to three years.

2 SDG investing lets investors zoom in on their own goals. With 17 SDGs to choose from, there's no shortage of issues that an investor can use to zoom in on their own ambitions, allowing them to direct and manage exposure to their chosen SDGs. This has helped make sustainable investing something specific and measurable.

3 Achieving the goals leads to massive business opportunities as it means investing in the companies whose products and services can progress them, from making telecoms accessible in remote areas to rolling out healthcare and education facilities to a wider populace. Some companies and sectors are naturally more attuned to contributing to the SDGs than others, which in turn has directed investment flows.

4 We can identify how companies contribute to the SDGs when they make products or offer services that help achieve one or more of the 17 goals. Some businesses by their nature contribute to particular SDGs, while others may be better placed to contribute to a whole theme or bucket, such as meeting basic needs.

Framework

All in all, the SDGs provide a framework to define a sustainable philosophy and priorities at a corporate level, track progress over time, and use a consistent reporting methodology that can be applied across the majority of asset classes.

To this end, Robeco has created a proprietary SDG Framework: a robust tool that systematically evaluates companies based on their performance across key SDG-related targets. A company's overall performance across the most strategically relevant SDGs aggregates into an overall company SDG score. The resulting SDG scores are used to construct portfolios that pursue positive impact and avoid negative impact, thereby advancing sustainable progress in the economy, society and the natural environment.

> *“Are you winning a discussion, or are you losing each other?*
>
> SIRE

Gijs, 13 years old, son of Karin van Baardwijk

connection

Karin van Baardwijk
Chief Executive Officer

Observing – with a winner's eye

ROTTERDAM (51°55'21"N, 4°28'45.01"E) - "Gijs is a proper adolescent, a proper sportsman too. He plays field hockey four days a week. But most of all he's disarming, observant and sensitive. 'A wise old soul', in a certain way. There's a maturity in the way he takes in his surroundings. Breathing in life *to the max*." When you hear Karin van Baardwijk talk about her son, she unconsciously is painting a picture of herself.

"Gijs is always aware of his surroundings. If those seem fine, he's happy." And if they don't, then he'll try to fix it. Gijs is captain of his field hockey team and takes on the responsibility befitting that role. He knows his teammates and their weaknesses and strengths well and sets them up for success in the team. "He doesn't shy away from being tough when it's necessary. But he'll follow it up with a pat on the shoulder. He's in it to win. Always. But he makes sure no one gets left behind in that process."

Observing, getting his ducks in a row, daring to intervene firmly, as well as having empathy and the will to win. You don't need to think too hard to know who he gets those traits from. Karin is also the captain, albeit on a very different playing field.

"I know very well what I'm good at and what I'm less good at. My responsibility is to put the pieces on the chessboard in the right place, in such a way that they work together optimally."

'Empowering people,' to quote a buzzword. Buzzword or not, empowerment is crucial. Micro-managing does not fit Karin, but she does observe carefully – with a winner's eye. "If I notice that a carriage is in danger of going off the rails, I take action."

On sustainability and purpose

“Robeco has a clear culture, heritage and DNA. A big part of that is our Dutch trade spirit and our research. We put those to work to sustainably allocate the assets that clients entrust to us.” This is less straightforward than it sounds. Sustainability is more than putting a spot of green paint on dark gray products. It requires integrity and integration. And as Karin puts it: sustainability does not solely lie in the hands of the SI team, it is not a topic that can be steered and managed in isolation. Sustainability must be integrated in all of the investment processes.

“That’s what sets Robeco apart: the extent to which sustainability is integrated in all we do. It is our strong believe that this is how it should be done if you want to make a difference,” Karin states. Of course, there are also dilemmas and, from time to time, inevitable discussions about performance and sustainability – and whether the two reinforce or (sometimes) interfere with each other. But the chosen path is crystal clear.

“A company’s identity, its credibility and purpose, is becoming increasingly important. I am convinced that our thought leadership in SI goes hand in hand with our commercial interests. Striking a balance is everything, even as knowing who you are and who you are not. We are an active asset manager that aims to help our clients achieve both their financial as well as sustainability goals.”

On going up against the behemoths

Being and staying ahead in the field of SI not only takes effort, it also requires innovation and thus investments. After all, how does a mid-sized asset manager stay ahead of the big players, with their much deeper pockets? It’s not an issue that worries Karin.

“Demonstratable evidence is key. Every day we provide the evidence of what we are doing in terms of sustainability and ESG integration. The quality of our SDG framework or biodiversity framework, and the quality of our people and research is measurable. Everything we do is research-driven, and that helps us to be able to quantify sustainability.”

This also requires continuous investments. But not as a separate line on the balance sheet. “Sustainability is everywhere. You invest in the whole value chain and with that the quality of everything you do in terms of SI increases.”

Does that resonate with clients? “It does, although performance is always key. If performance is good, the rest of the conversation is easier. Sustainable investing is a topic in every client meeting I have recently had. We see many clients face challenges around regulations or how to evaluate asset managers.”

“We help our clients in their individual journey, in establishing their own SI roadmaps and provide education when requested. And that creates connection. Ultimately, it’s about trust and credibility. Trust comes down to practicing what you preach, demonstrating the quality of your investment solutions, your research, and people.”

On knowledge, and sharing knowledge

Continuous education is of essence. Knowledge of sustainable investing should be promoted throughout the organization, Karin says. Because ultimately, human capital determines the degree of success. It is people that create the models and do the research, their knowledge is the distinguishing factor.

“Take our SDG framework. The results of any model depend on what you put into it: your data and research. So last year we opened up that framework to a select group of clients and academics. All we expect in return is feedback in order to further improve our data and models.”

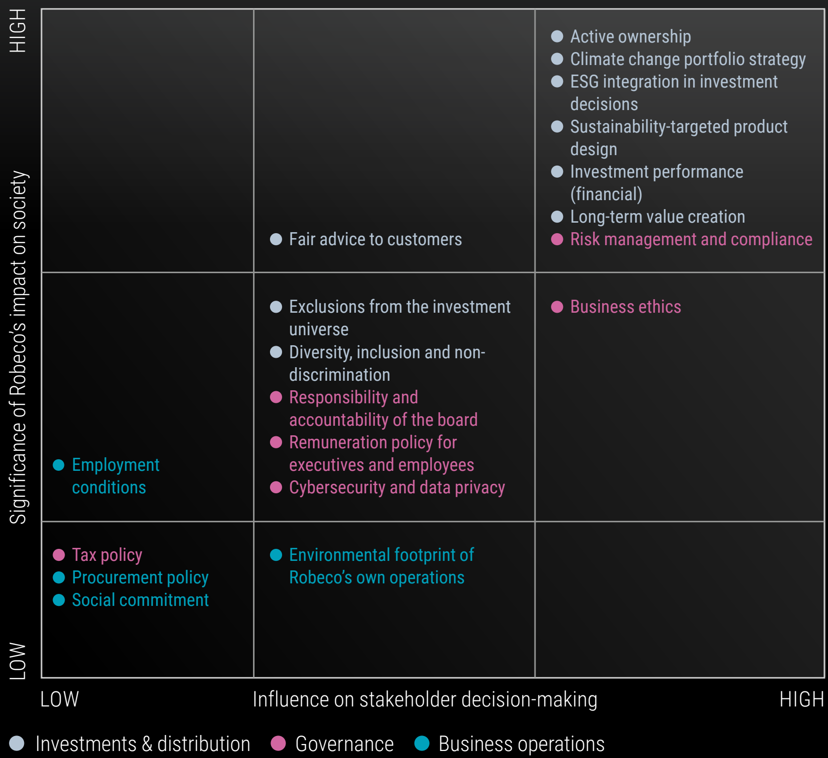
There’s a continuous need to innovate and to invest both in people, data, and new ideas and to share knowledge. Cooperation with the World Wildlife Fund on biodiversity is one example. “When we combined our knowledge and skills as investment engineers with their knowledge and data on biodiversity loss, new innovations came to life, and a long-term partnership is built.”

Quantifying sustainability: Talking the talk and walking the walk

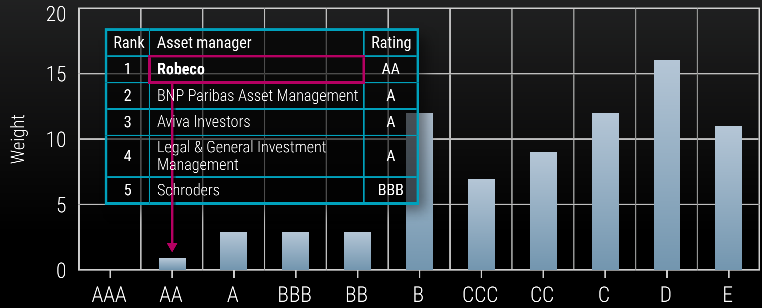
Robeco's mission is to enable clients to achieve their financial and sustainability goals. Our vision is to safeguard economic, environmental and social assets; a prerequisite for a healthy economy and the generation of attractive returns in the future. We are proud to see these efforts recognized once again by ShareAction, who ranked us 1st among more than 75 global peers in their 2023 Responsible Investment Benchmark report.

Stewardship
Active ownership means responsibly managing the assets that have been entrusted to us and reporting openly to our clients on how we uphold sustainability principles.

2021 Materiality matrix
Following the Global Reporting Initiative (GRI) guidelines, an aspect is considered material when it influences the decision-making of our stakeholders or reflects a significant economic, social or environmental impact of our organization. We update our materiality analysis every year in order to assess material topics that are of interest to stakeholders and have an impact on our business.



The most sustainable asset manager of 'em all – again
Robeco has been ranked the world's top manager for sustainable investing in the 2023 ShareAction Responsible Investment Benchmark report. Robeco is the only asset manager to score an AA rating out of 77 global firms assessed by the UK-based research firm. It is the second consecutive time that Robeco was ranked first.



Rank	Asset manager	Rating
1	**Robeco**	AA
2	BNP Paribas Asset Management	A
3	Aviva Investors	A
4	Legal & General Investment Management	A
5	Schroders	BBB

Source: ShareAction, 2023

ShareAction gives ratings (from AAA to E) based on five core sustainability capabilities – governance, stewardship, climate, biodiversity and social. While no one scored an AAA rating, Robeco was unique in getting AA, while only three other firms received an A score.

Key figures

200.7
EUR – BILLION
Assets under management

195.3
EUR – BILLION
Managed in ESG-integrated assets

389
EUR – BILLION
Assets under engagement

7,723
Shareholder meetings voted

226
Companies engaged

270
Engagement cases

62%
Number of cases closed successfully

26
Number of engagement themes

154
EUR – BILLION
Assets under voting

54%
Meetings with votes against management

78,799
Number of proposals voted on

For all other figures on this page:
Source: Robeco, 31 December 2021

Open Access Initiative

Investors are embracing the SDGs. But effectively investing in SDGs needs a common unified approach. As a first step Robeco has launched an open access platform to share its SDG Framework, promote and encourage research and ideas, and offer free insight into individual company SDG scores. In this way, stakeholders can optimize the impact of these investments.

Sustainable investing takes place in a scattered environment with a lot of different legislation, definitions, areas and interpretations. As a result, effectively incorporating sustainability is complex and requires all stakeholders in the value chain to be involved. Using common frameworks drives understanding and effectiveness as well as providing insight into the impact across society. This goes for SDG investing as well. There are multiple ways in which to invest in the SDGs, and also multiple frameworks available for this purpose. The most important feature a framework must possess for use as an investment tool is accuracy.

Open access framework to make it better together

We are now opening up our SDG Framework and scores to all stakeholders interested in SDG investing in order to improve the framework going forward. Offering the scores and framework to academics, investors and SI experts for further research, we are also actively asking for feedback and enhancements – using all knowledge and insights to make the framework even better, so that it can truly be a common unified basis for SDG investing.

We expect that collaboration via the open access framework will encourage a much deeper grasp of the SDGs, help the investor community understand the risks and opportunities involved, and enable an optimized approach to impact investing. Opening up our SDG scoring system is the first step. At a later stage, Robeco may also make other SI data available.

The SDG Framework is used for many of Robeco's client portfolios. These include some of the world's biggest asset owners like UBS Global Wealth Management, BBVA AM, Standard Chartered Bank and Pensioenfonds ING, who are all keen supporters of Robeco's SI Open Access initiative.

Open Acces Initiative

As a thought leader in sustainable investing we are committed to education on the topic of SDGs. Therefore we have given access to our SDG research database to 600 clients and 60 academics. With their feedback we can further improve our models. In our SDG Framework we score more than 10,000 companies based on their SDG contribution.

600

clients have access to the portal

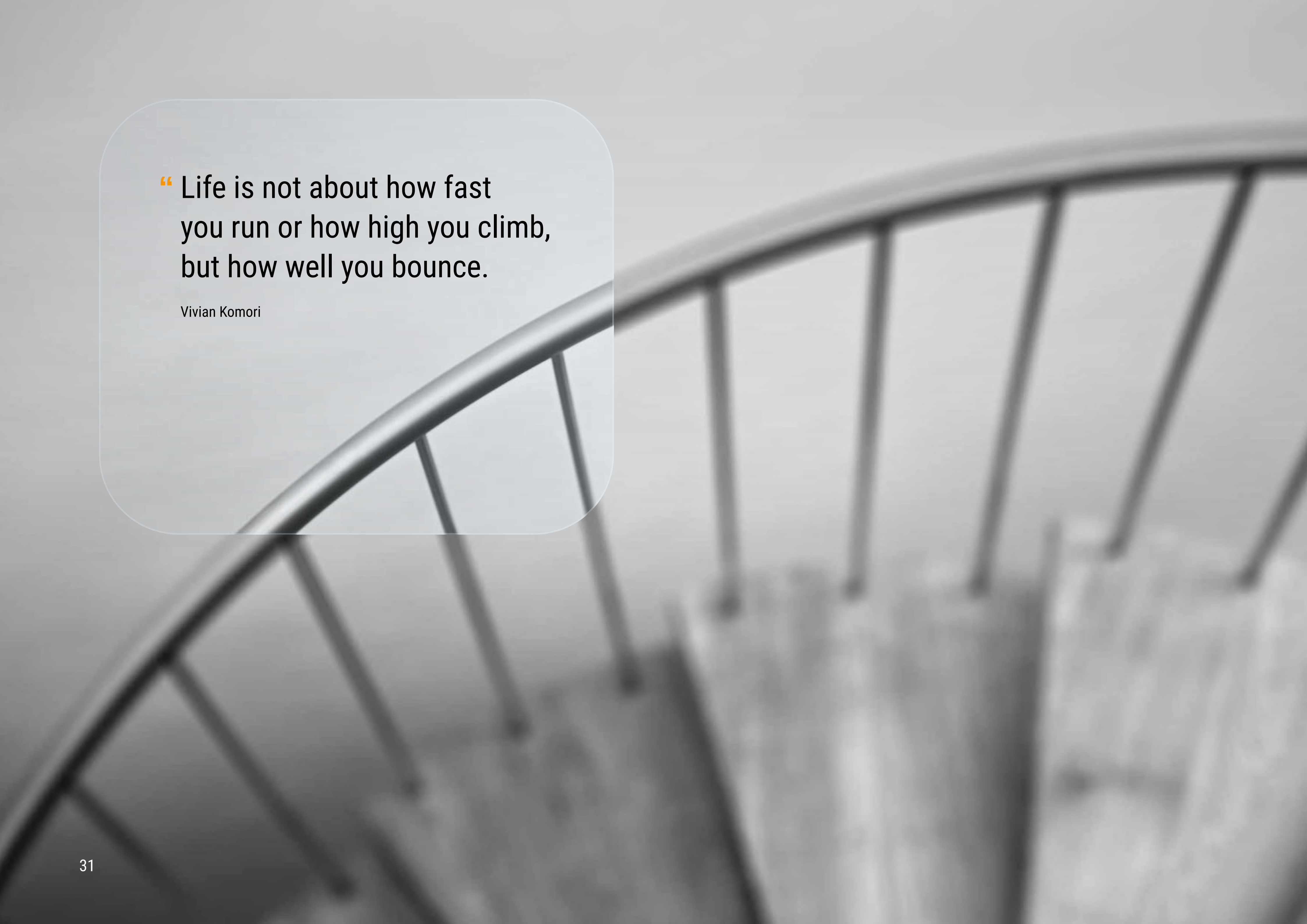
60

academics, globally, have access

11,948

companies are scored in the SDG framework

Source: Robeco, figures as of March 2023



“ Life is not about how fast you run or how high you climb, but how well you bounce.

Vivian Komori

Maria, 17 years old, daughter of Thu Ha Chow

Thu Ha Chow
Head of Fixed Income Asia

It's all about upgrading the Bs and Cs

SINGAPORE (1°18'52.79"N, 103°50'43.47"E) - If 2022 and, indeed, all bear markets in the past taught us anything, it's that investors must be resilient. What doesn't kill you makes you stronger. Thu Ha Chow knows a thing or two about this, partly due to having lived in a refugee camp as a child. And once she graduated with a degree in economics, it led her to join missionary organizations to work with impoverished children in Asia.

Drawn to the plight of the marginalized, she was also inspired by their resilience, how it manifested in their creativity with limited resources, and showed the potential for communities to flourish under the right circumstances. Financial reality led Thu Ha to settle for the male-dominated world of finance, where social and environmental goals initially clashed with financial priorities. But economic thinking evolved to recognize externalities and their true impact, giving birth to Sustainable Investing (SI).

"Without SI, I don't know if I'd want to continue working in this industry – if it was just about alpha and outperformance. Been there, done that, got the T-shirt!," Thu Ha says. SI led her to Robeco, and the SDGs are her tool in the quest for a better world – especially one for the next generation.

Her daughter Maria also knows what resilience is. To become more resilient, she seeks out resistance; to push herself. Physically – she does weightlifting and boxing – as well as consciously choosing the path of most resistance in other respects. Thus, at 16, she chose to study material science, despite struggling with math at the time. For Maria, improving your weaknesses is more valuable than just focusing on your strengths.

Thu Ha says, "Resilience teaches us how to deal with adversity and continue learning. I think Maria sees this in me: a person with dyslexia who loves reading."

On the SDGs and a better world

Thu Ha never wanted to get into asset management. Her interest was in development economics – particularly within emerging economies and she dreamed of working at the World Bank. Eventually, as children of immigrants often do, she just made a go of everything that came her way. Hard work. Building resilience. Working her way up.

“Everything came together for me, personally and professionally, with the SDGs. From an economic development perspective, achieving the SDGs enables you to build resilient economies and businesses.”

Applying the SDGs, especially at a granular level, is sometimes a bit more complex, but conceptually they work, Thu Ha argues. “We are very clear at Robeco about how we invest and in what ways we want to contribute to the SDGs. Of course, we’re not perfect, but the goals are clear.” SDGs were conceptually developed to be applied to countries, but thanks to internal research, they are now also applicable to companies. “A big step that had to be taken. SDGs are hugely important because they give us a language. Without this common language, everyone would mean something different when they talked about SI.”

On the Holy Grail and capitalism

It is an illusion to think that through investment portfolios, a positive impact can be exerted on all 17 SDGs, let alone on all the subgoals. “Due to the nature of the companies in which you invest, you always have a bias toward a limited number of SDGs. Because they are designed to apply to countries, you can’t tick every box at the company level.” It’s different at the country level because the focus there is broader. That’s where you can work towards more resilient economies, with more equity and stability. Countries do not start at the same level; one country has much more resources than another, and climate risks also vary from country to country.

“The end goal is the same, but the starting positions differ considerably.” This raises the question of how diametrically opposed the SDGs are to the spirit of capitalism. Thu Ha takes a philosophical approach. “The aspect of capitalism we deal with is the market mechanism, which is essentially a mechanism to efficiently distribute resources. However, as a society, we need to set goals for what the resources need to achieve. SDGs help us set the right goals.”

On challenges

Everyone has different talents: not everyone is effortlessly the smartest in the class. Sometimes you have to work very hard to get a little better. For economies and businesses, the same is true. Herein lies a paradox. Sustainable investors often avoid the companies that don’t excel in sustainability, if only to avoid the appearance of greenwashing.

“But these are the very businesses that can improve with help and monitoring. The entire spirit of the SDGs lies in the potential for improvement. The challenge is in investment models. You don’t want to lower the standard, but at the same time, using the SDGs, you want to upgrade those Bs and Cs to become A students.”

In Norway and Sweden, the SDGs are not going to be a game-changer as they are already doing well. The same applies at the corporate level. The good news is: at least we know the problem, even if we don’t have all the answers yet.

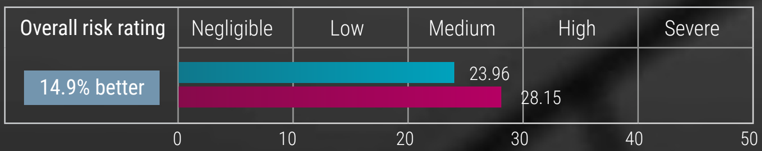
“There is always tension when we look at developing countries. You can’t tell Cambodia to shut down coal-fired power plants when in some places they only have a few hours of electricity a day: you need to work towards a transition plan. We’re mostly familiar with models with negative filters in this industry. For me SDGs articulate sustainability targets, and it’s our job to create investment opportunities to meet them.”

Quantifying sustainability: SDGs are the pathway to a more resilient world

The SDGs, if they are achieved, will give our system greater social, environmental and economic resilience. This resilience is what people need for their lives with all its ups and downs. But resilience is also needed on a corporate level and on country level; it is what our world desperately needs. Hence, resilience – measured by a strong SDG profile – is what we need in our portfolios.

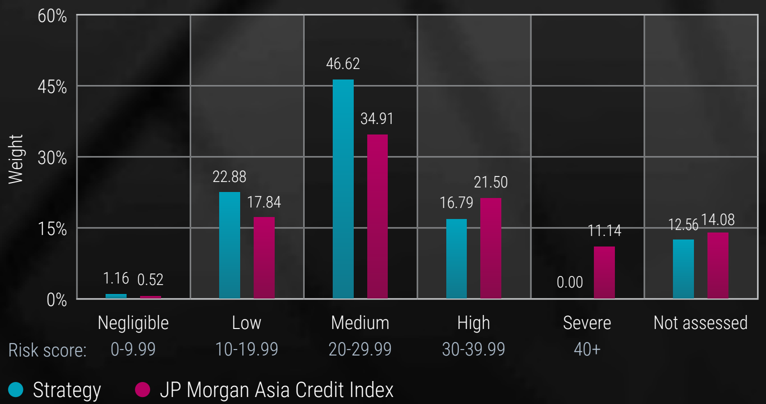
Sustainalytics ESG Risk Rating
The Portfolio Sustainalytics ESG Risk Rating chart displays the portfolio's ESG risk rating. This is calculated by multiplying each portfolio component's Sustainalytics ESG Risk Rating by its respective portfolio weight.

Sustainable Asian Bonds' Sustainalytics ESG Risk Rating

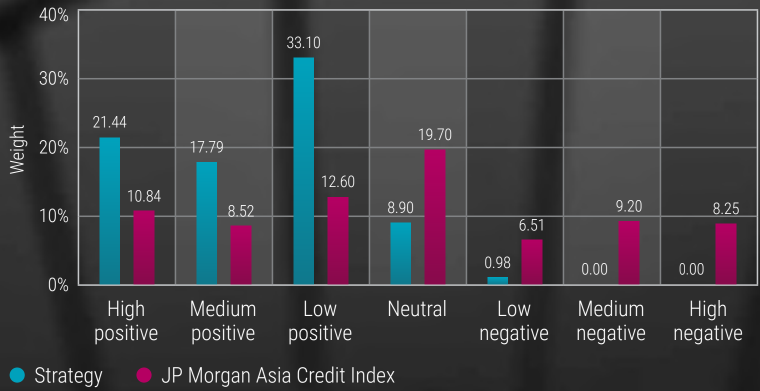


The distribution across Sustainalytics ESG Risk levels chart shows the portfolio allocations broken into Sustainalytics' five ESG risk levels: negligible (0-10), low (10-20), medium (20-30), high (30-40) and severe (40+), providing an overview of portfolio exposure to the different ESG risk levels. Only holdings mapped as corporates are included in the figures.

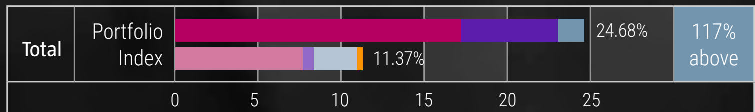
Sustainable Asian Bonds strategy's distribution across Sustainalytics ESG Risk levels



Distribution across SDG scores
The strategy allocates a substantially higher weight to companies with a positive contribution to SDGs than the reference index.

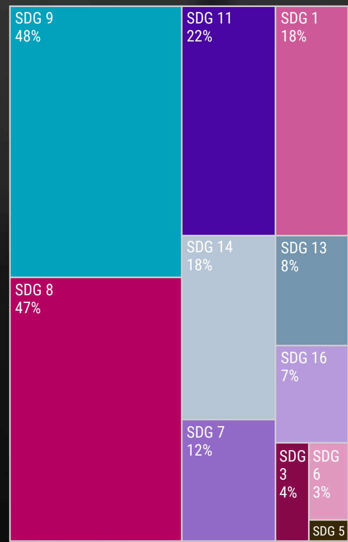


ESG-labelled bonds
The allocation to ESG-labelled bonds (mainly green bonds; but also social bonds, sustainable bonds and sustainability-linked bonds) is more than twice as big as the benchmark.
The Smart ESG score of the strategy also beats the benchmark on the E, the S and the G.



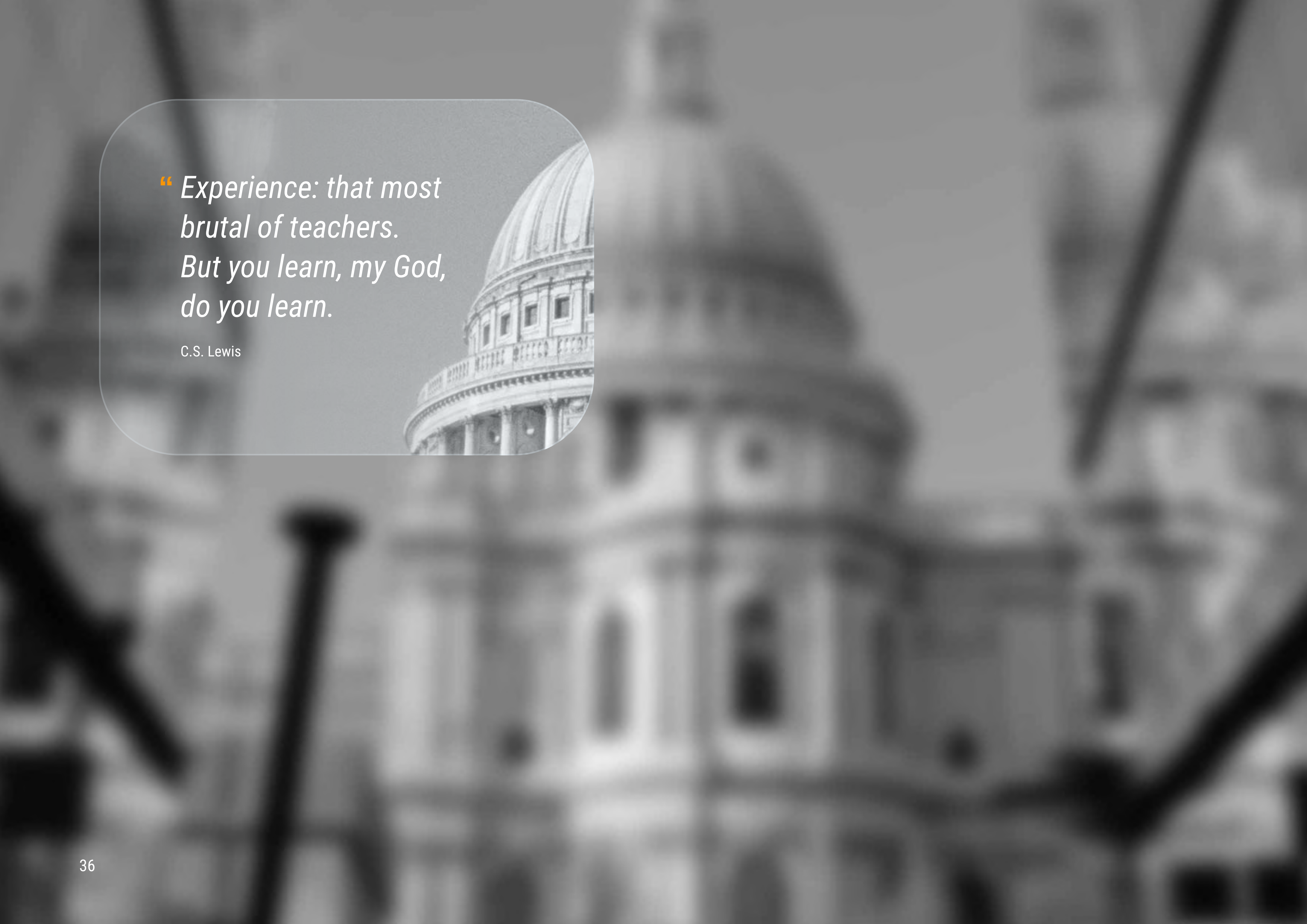
ESG-labelled bonds	Portfolio weight	Index weight
Green bonds	17.29%	7.79%
Social bonds	0.00%	0.54%
Sustainable bonds	5.79%	2.62%
Sustainability-linked bonds	1.60%	0.42%

SDGs 8, 9 & 11
The Sustainable Asian Bonds strategy has significant positive exposure to a number of SDGs that are really important for economic development in Asia and other emerging countries: SDG 8 (Decent work and economic growth), SDG 9 (Industry, innovation and infrastructure) and SDG 11 (Sustainable cities and communities).



SDG Impact Alignment: portfolio breakdown per SDG

For all figures on this page:
Source: Robeco, March 2023



“ Experience: that most brutal of teachers. But you learn, my God, do you learn.

C.S. Lewis

Thomas, 13 years old, son of Colin Graham

agility

Colin Graham
Head of Multi Asset Strategies and Co-Head of Sustainable Multi Asset Solutions

The impressionist art of sustainable portfolios

LONDON (51°30'26.4636"N, 0°7'39.9288"W) - Multi-asset investing is a bit like simultaneously playing five games of chess. Things that demand your attention are happening everywhere all at once. Agility is a prerequisite. Colin Graham takes it all in his stride. "Every day something happens that can change our view of the world or client portfolios. So we start every day by checking if our thoughts from yesterday still stand in light of new information."

Separating noise from signals is crucial in this regard. Being able to do that is mainly a question of experience – and data. But the most important thing is to avoid mistakes. "From some sources of noise – such as social media – you have to take a broader perspective, as an investor; to avoid falling into the trap of groupthink."

Thomas, Colin's son, is also a pro at this kind of agile switching. At school, where he's got to get from one subject to the next without having a proper break in between, but also in his free time. There he alternates between rowing, rugby, soccer and cricket – all sports that each require a different mindset.

He feels equally at home in the online gaming world with his friends as he did while climbing the Three Peaks with his father. Scafell Pike and Snowden can already be checked off. Only Ben Nevis is still waiting to be climbed. And Thomas also has an eye for sustainability.

"At school they pay much more attention to sustainability than they did in our time. Just the other day he very enthusiastically told us about a straw that had been invented that automatically filters water into clean drinking water." Separating noise from signals, so to speak.

On the ability to move quickly

Fingers on buttons is the adage. But without being too trigger happy. More quietly watching for the opportunities to come along and listening to team members that have different perspectives. That's what years of experience have taught Graham.

"Every day you scan the news and the markets. And you try to anticipate how markets will react. A corporate scandal? Then you know that the overall market will sell it off 'in its entirety' instantly. Or the effect of disappointing earnings from 'bell weather' companies on sentiment and valuations. For most investors, it's shoot first, ask questions later. One of the unintended consequences of lower trading costs and more passive vehicles will be higher volatility in the markets."

But even outside of scandals and incidents, it's still a question of monitoring the big investment dashboard every day. Looking at spreads, the currency markets, interest rates, commodities markets, equity valuations and volatility. Are all parameters moving in proportion to each other? Or is one of the chessboards showing signs of imbalance?

"That's when you know something is about to give. And often the stock market's wearing rose-tinted glasses. Although it's a given that the good times tend to last longer than your mathematical models seem to be indicating."

On a sustainable multi-asset portfolio

As if playing multiple games of chess at the same time wasn't hard enough, sustainability, a constant foundation of our approach, has become an even more critical building block in all considerations in recent years.

"We invest to make returns for this generation without harming the world of the next one. The SDGs here are considerably helpful, as they provide the framework that helps ensure well-being of the next generation." That's a huge step up from ESG investing. Colin refers to that as "sustainable accounting," while he sees the SDGs as really articulating ambitions for the future.

"It gives what we do here and now a true purpose. Delivering competitive returns to clients within their risk budget in a sustainable way." It's all a logical next step in the maturing of the industry, Graham argues.

"Fifty years ago there was no risk management; it was all about returns. Then, through trial and error, the focus shifted to that aspect. And now SI is the next evolution. What I mean by that is: you have the cost of capital, the cost of labor and now the cost of a sustainable world; all of which you now take into account in investment models."

On being a jack of all trades

For the really deep insights, Graham checks in with the various experts in his team. Being agile doesn't mean having to be an expert on all fronts. Not by a long shot. It's actually a fancy name for being a jack of all trades, Graham says. But when it comes to what's going on in his portfolios, he is actually a master. And that's a lot. Also in terms of the sustainable SDG filter.

"We look at the country level, for example. Equal opportunities for girls in terms of education is much easier to observe in Indonesia than in India. We then analyze what long-term policies are in place. We look at economic growth in both countries, welfare growth. And then you might end up with a currency pair trade where you sell the Indian currency and buy the Indonesian one if the other parts of our investment process are aligned."

Is it actually possible to put a sustainability score on the entire multi-asset portfolio, based on pluses and minuses? "We compare everything to the benchmark. But we also look at SDG scores of individual companies. At water use. Waste management. And at the carbon footprint of our portfolio – which in 2022 was well below that of the benchmark. If there are any outlier companies in client portfolios, we will review our SI Center of Expertise's SDG and engagement reports."

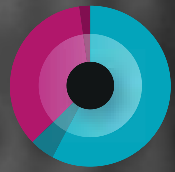
"It's a bit like impressionist art. If you look up close you see all the numbers and signals, but from a little more distance and by letting your gaze relax, you see the story a total portfolio is telling."

Quantifying sustainability: Navigating on the newest available data

Multi-asset investing has undergone a true metamorphosis in recent years. Knowledge and data are ever increasing, as are technical innovations. For active investors, that means being flexible and agile is key. You can navigate on new data and regulations on sustainability, for example. Ultimately, that leads to a trade-off between return, risk and sustainable objectives.

Impact of exclusions on active security selection

For our global 60:40 Equity-Bond portfolio we exclude 5% of the equity universe and 2% of the bond universe, based on Robeco's exclusion policy.



Equity	60%
Excluded equity	5%
Fixed income	40%
Excluded fixed income	2%

For Sustainable Multi-Asset Solutions

> 50% SI

At least 50% of the strategy's assets must be sustainable investments.

-2 & -3 excluded

Companies with SDG scores of -2 and -3 are excluded.

CSR > 6

For government bonds a Country Sustainability Ranking average score of 6 or higher is needed.

CO_2 < Index

The carbon footprint of the portfolio should be lower than the index (Scope 1 & 2).

Environmental footprint

Environmental footprint expresses the total resource consumption of the portfolio per mUSD invested. Each assessed company's footprint is calculated by normalizing resources consumed by the company's enterprise value including cash (EVIC). We aggregate these figures to portfolio level using a weighted average, multiplying each assessed portfolio constituent's footprint by its respective position weight. Sovereign and cash positions have no impact on the calculation.

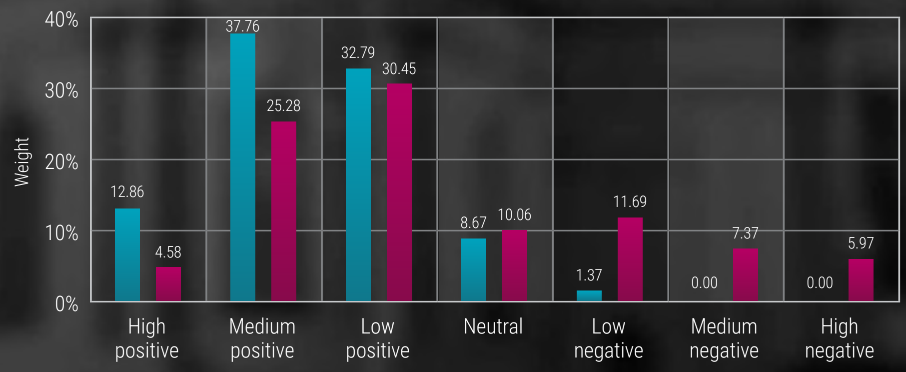
Metric	Comparison	Strategy	Reference index[1]
GHG emissions Scope 1&2 tCO_2eq/mUSD revenues	The difference is equivalent to the annual CO_2 emissions produced by 20 cars per USD 100 mln invested — 20 CARS		
41.3% below		45.67	77.84
Water use m^3/mUSD	The difference is equivalent to the annual water consumption of 78 people per USD 100 mln invested — 78 PEOPLE		
63.1% below		2,407.30	6,516.37
Waste generation Tonnes/mUSD	The difference is equivalent to the annual waste generation of 22 people per USD 100 mln invested — 22 PEOPLE		
28.8% below		27.79	39.02

Strategy Reference index[1]

SDG Impact Alignment

This distribution across SDG scores shows the portfolio weight allocated to companies with a positive, negative and neutral impact alignment with the Sustainable Development Goals (SDG) based on Robeco's SDG Framework. The SDG score ranges from positive to negative impact alignment with levels from high, medium or low impact alignment. This results in a 7-step scale from -3 to +3.

Distribution across SDG scores



Strategy Reference index[1]

Source: Robeco Switzerland Ltd. Certain underlying data is sourced from third parties (such as e.g. CDP Europe Services GmbH), March 2023

1. 60% equity (MSCI AC world in GBP), 40% bonds (Bloomberg Global credit hedged GBP)

Source: Robeco data based on Trucost data. S&P Trucost Limited © Trucost 2022. All rights in the Trucost data and reports vest in Trucost and/or its licensors. Neither Trucost, nor its affiliates, nor its licensors accept any liability for any errors, omissions or interruptions in the Trucost data and/or reports. No further distribution of the Data and/or Reports is permitted without Trucost's express written consent.

> “ *Waking up to an alarm clock is like getting punched in the face by time.*
>
> J.R. Rim

Alice, 7 years old, daughter of David Thomas

alarm

David Thomas
Portfolio manager Biodiversity Equities

Half of global GDP is attributable to nature

ZÜRICH (47°22’0.01”N, 8°33’0”E) - An Australian in Switzerland – for some, it’s hard to imagine a greater contrast between two countries and lifestyles. Stereotypes might spring to mind of the laid-back culture Down Under to the precision work of the Helvetic confederacy. But practice, as so often, proves less problematic than deep-rooted clichés suggest. The odyssey across the great waters seems to have worked out well for David Thomas. After spending the first six months on the Old Continent as a stay-at-home dad, David is the lead portfolio manager of the brand new RobecoSAM Biodiversity Equities strategy.

Young Alice was a bit wary, though, after crossing in January 2022. A different country on the other side of the world, different languages. And, of course, different children around her at an international school. But she too, though somewhat reserved and cautious by nature, has found her niche. She did have to overcome some hurdles. The biggest impact was that Covid-acquisition Ginny, the dog, couldn’t come too. In every drawing Alice makes of the family, the dog is there. The loss of biodiversity at home is tangible.

David himself also has a knack for filling in the blanks a bit when situations become difficult or threatening. “I was able to manage situations where I was scared out of my wits by visualizing a positive outcome. When I first had to jump out of a plane from 12,000 feet, I visualized myself gently floating down toward the vineyards of Hunter Valley. The reality, by the way, was that I landed in a pretty painful and embarrassing way.”

On the economic impact of biodiversity loss

Although David says he generally sees the glass half full, when it comes to biodiversity there are plenty of reasons to be seriously alarmed. Because simply hoping it will work out in the end, or visualizing future progress, is not enough. There is much work to be done and the urgency to act on many fronts is growing.

"Governments, businesses, investors, we all need to get on board to reverse the trend of biodiversity loss. It is a serious challenge and we need major shocks and authority of actions to arrest this big decline." The question is whether the urgency is felt widely enough to push all involved in the right direction. COP15 in Montreal did produce real progress. David particularly welcomes the '30-by-30' commitment made there, to have restoration completed or underway on at least 30% of degraded terrestrial, inland waters, and coastal and marine ecosystems by 2030.

The agreements on financing (USD 200 billion per year) also feel positive to David. "But we know that frameworks and agreements have been made before, particularly around climate issues. In terms of actual approach, progress at times has been frustratingly slow."

That the risks surrounding biodiversity loss have risen high on priority lists in recent years is, paradoxically, good news. "There are potentially huge economic implications on the continued pathway of biodiversity loss. According to figures from the World Economic Forum, over half of global GDP is attributable to nature."

On a pure-play strategy

2022 was the year the asset management industry launched the first products with 'biodiversity' in their name. But that label covers a diverse range of offerings. "You can see broadly two approaches in our industry. The first focuses on industries that have a small footprint. That gives you portfolios with significant weightings in technology, financial services, software and telecommunication companies. There you will end up with investments in Microsoft and Alphabet which may have limited negative impact. But ultimately they aren't the companies tackling the problem of biodiversity loss."

It's not the approach David has taken. "We want to get to the core of where biodiversity loss has been created and find companies that will benefit from the transition to a nature-positive world. Those that are sourcing sustainably, providing regeneration and restoration solutions, deserve support and will emerge as winners from the crisis." This populates a portfolio with many small and mid-cap companies and themes such as sustainable land use, marine systems, freshwater networks and traceable products.

"This means we take a narrower approach, but as a result are closer to the problems causing biodiversity loss. Particularly clients with a focus on impact value this approach."

On data and research

Collaborating with the World Wildlife Fund, a major player with more than 100 offices worldwide which generates a lot of knowledge and research, helps build a strategy like this. "They are acutely aware of the specific problems, and agree with our targeted approach with an investment universe of around 240 stocks (180 of which are small and mid-caps), although we're the ones at the helm." These are by definition stocks for which less research is available, but that provide greater opportunities for creating alpha.

"The idea is that the biodiversity theme outperforms the MSCI World, and we outperform the theme through our disciplined investment approach. But for this we need to dig deeper than others, and work harder." Again in this area, the shared knowledge with the WWF is invaluable. "This helps us measure impact and stay up to date on the latest challenges, technologies, regulations and government priorities. That, in turn, helps us to stay ahead of the game and build a knowledge advantage."

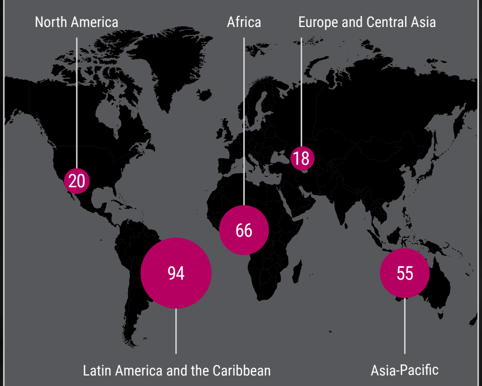
Quantifying sustainability: The economic imperative of turning the tide

Protecting biodiversity isn't simply an issue of saving an obscure monkey from planters in South America. Put simply, nature underpins everything that we do, and without it, the world cannot function. This is not just a moral obligation – it is an economic imperative. More than half of the world's economic output valued at USD 44 trillion is at least moderately or highly dependent on nature in some way, according to the World Economic Forum (WEF). For food production, the ratio is even higher, as more than 75% of global crops, including fruit and vegetables, rely on animal pollination.

Biodiversity is gaining attention
Biodiversity loss now ranks third in the list of global risks as identified by the World Economic Forum (2022).

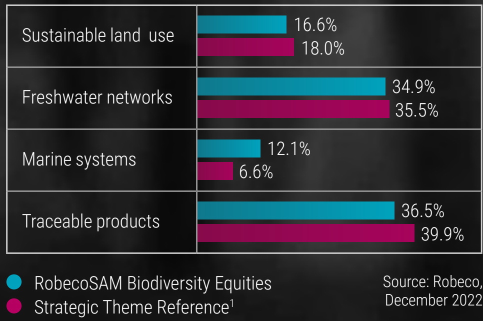
Top 3 global risks by severity (WEF 2022) over the next 10 years	
1	Climate action
2	Extreme weather
3	Biodiversity loss

Biodiversity loss by region in %



Source: World Economic Forum Global Risks Report 2022

A pure-play strategy – In the portfolio we cover four major themes: Sustainable land use, Freshwater networks, Marine systems and Traceable products.



Source: Robeco, December 2022

Farmed Atlantic salmon[2] is a resource-efficient food source with a strong Food Conversion Ratio (FCR)
The FCR is measured in kilograms (kg) of feed required per kilogram (kg) of weight gain. The lower the number, the more resource efficient the food.

Source: Robeco analysis, company filings and website, UN Sustainable Development Goals.

CASE STUDY

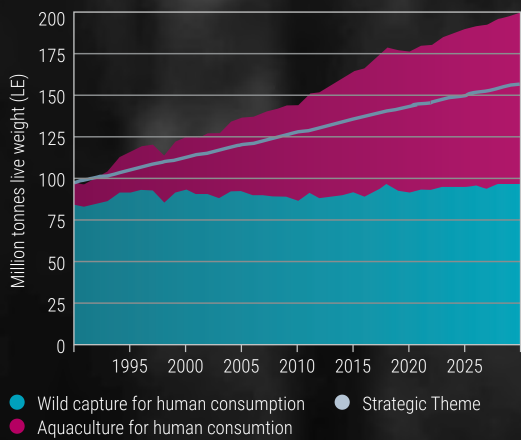
The rapidly growing aquaculture market as a global food solution

- By 2029, fish consumption is estimated to be 21.4 kg per capita compared to 9.9 kg in the 1960s and 20.6 kg in 2020.
- This increase in per capita consumption is equivalent to another 20 million tonnes of seafood supply, which aquaculture is estimated to provide over the next decade.

Related SDGs

SDG 2 ZERO HUNGER
SDG 3 GOOD HEALTH & WELL-BEING
SDG 14 LIFE BELOW WATER

Aquaculture is the strongest growing segment of the global seafood market



Source: OEDC, *World bank

Sources: Marine Harvest Salmon Industry Handbook 2021, Global Market Insights: Aquaculture Vaccines Market will surpass USD 290 million by 2025, TheFishSite, GrandView ResearchSource chart: OEDC, *World bank.

37,400[3]
Species threatened with extinction

5 key threats[3]
Agriculture, overharvesting, urbanization, pollution, and invasive species & disease

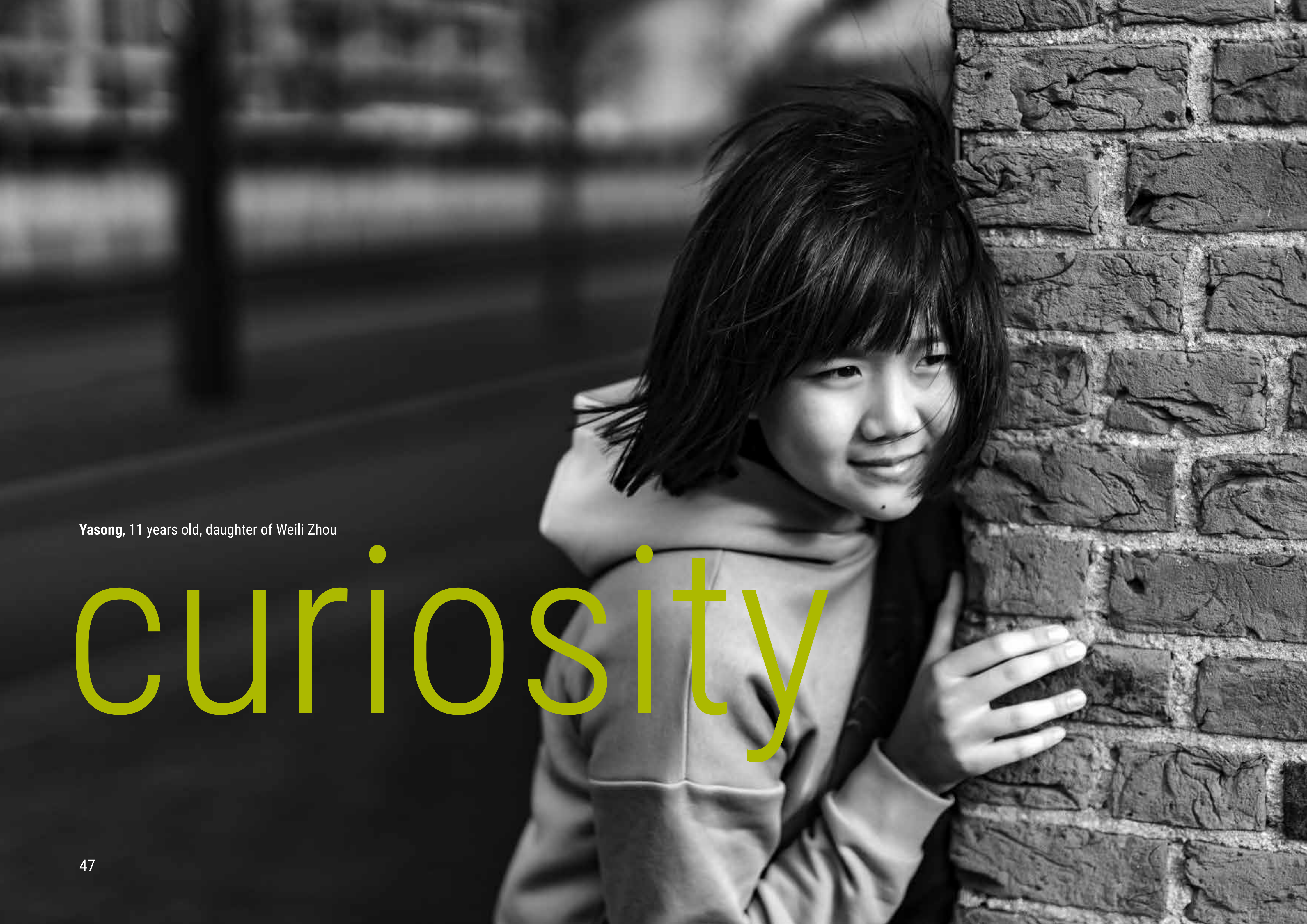
USD 44 trillion[3]
Economic value generation moderately or highly dependent on nature

USD 3.6 trillion[3]
Expected new annual business opportunities by 2030 from sustainable food, land and ocean use

1. Refers to the Strategic Theme Reference (STR): market-cap adjusted reflection of the universe.
2. The company shown on this slide is for illustrative purposes only in order to demonstrate the investment strategy. It cannot be guaranteed that the strategy will consider the company in the future. No reference can be made to the future development of the company.
3. Source: World Economic Forum, 2020.

“ I have no special talent.
I am only passionately
curious.

Albert Einstein



Yasong, 11 years old, daughter of Weili Zhou

curiosity

Weili Zhou
Head of Quant Equity Research

Shifting from what to why is essential

ROTTERDAM (51°55’21”N, 4°28’45.01”E) - From *what* to *why*. That move, however subtle it may seem at first glance, typifies Weili Zhou. Her sense of curiosity was present from a very young age. And it’s a quality she never outgrew. As a child, she read everything she managed to get her hands on, in late last-century China.

Then, as a teenager, she got a job at the library just so she could borrow two books a week, instead of one. Novels, science fiction, but also academic books. Her interest was broad, her curiosity insatiable. “In China, I worked as a financial journalist for a while, but I was mostly reporting on *what* was happening on the market. What I really wanted to know was *why* markets went up or down.”

When it comes to Yasong, it’s clear the apple hasn’t fallen far from the tree. Raised on Dutch soil and daughter of Chinese parents; a child of two cultures. She picks up on the different versions of things; versions that are equally understandable. This begs questions. “Why do we eat vegetables cooked at home while people eat them raw at school?” The questions posed by Yasong reflect diversity in culture and tradition. She has learned to be curious, to think independently. But sometimes curiosity needs to be directed.

For a mother to whom algorithms hold no secrets, it makes sense for Weili to warn her child about the information bubble. “If you’re on TikTok a lot, you keep getting the same videos. That’s how the algorithm works, but if you’re really curious, you need to look further around you, broaden your horizons. I explain to her how easily you can be manipulated by the machine.”

On digging deeper and challenging the consensus

Curiosity, especially professional curiosity, in many cases equals critical thinking. Being skeptical; daring to challenge the consensus. "As a researcher, you have to keep asking questions. Is this what we were looking for? Did we find the root cause? Is the outcome robust?" While on a personal level Weili is always looking to broaden her interests, as a quant researcher she inevitably finds herself delving deeply into very narrow topics. "It's easy to just scrape the surface, like in my days as a financial reporter, but now I can go into depth."

The big question in all research, especially when it comes to combining quant investing and sustainability, is whether linking the two is going to pose challenges or bring opportunities to client returns. The quest began back in 2008, when sustainable quant portfolios were still a nebulous prospect, but Weili and her colleagues' curiosity was piqued. "It was pure curiosity that drove us: is sustainability data useful, and under what circumstances does it help deliver long-term excess returns? We wanted to know, and we were looking for this new source of information."

Intuitively, it sounded logical: responsible businesses should result in better returns and lower risk in the long run. But a researcher needs hard evidence, and must also challenge consensus. Starting in 2010, sustainability information was cautiously introduced into the quant strategies' selection models – initially with modest weighting.

On the impact of sustainability in quant models

Adding sustainability as a selection criterion might create unintended shifts in portfolios. For example, Weili and her team quickly found out that, straightforward ESG scores often lead to a positive tilt toward high-disclosure European equities and particularly large caps.

"Then you have to do the analysis: is this tilt going to add something? What is the investment impact on the portfolios of this?" Each answer raises new questions. The wide variety of sustainability-related elements that are now factored into investment models are nothing more than a number indicating how sustainably and efficiently a company operates. The knowledge behind that number often lies with the sustainability specialists. It's key to collaborate with them, then, on all fronts, to improve models.

"Our sustainability journey started with curiosity: about the possibility of generating alpha, but also about risk management. Right now, our search is for the best balance between sustainability and investment goals. Where is the sweet spot for clients with different goals?"

On actively doing nothing

Dilemmas are always there. Everywhere. For example, how does sustainability relate to the four traditional factors that are the pillar of Robeco's quant offering: value, quality, momentum and low volatility? "Quality is usually fine. Momentum has many faces: sometimes green, sometimes brown. Value and low volatility are inherently less green, with many energy and utility holdings. The crux for the researcher is looking for the same factor premiums while omitting from the portfolios the companies with the largest carbon footprint, for example."

Value is doing better than low volatility in this respect, because with value greening portfolios does not seem to cost returns. And yet another search for the missing piece of the puzzle begins. Those missing puzzle pieces never run out; the research machine never stands still. Models can always be improved.

Complacency is the worst enemy of any research team. "What I've learned over the years is the art of *actively doing nothing*. Doing nothing is laziness, but *actively doing nothing* means turning over every stone, constantly monitoring all processes, and asking yourself the question: if I change something, will the outcome be better? Especially in times of underperformance, that's a question you face regularly. But because our research is robust, more than half the time we don't adjust anything."

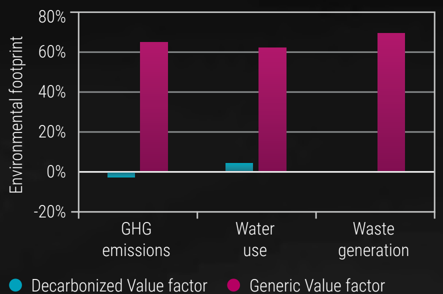
Quantifying sustainability: In search of the sweet spot

Decarbonizing Value is one of the ways to identify the sweet spot for our clients. Value, by nature is a 'brown' factor, but our research finds that we can decarbonize value portfolios – lower GHG emissions, water usage and waste generation – while keeping the risk-return characteristics intact.

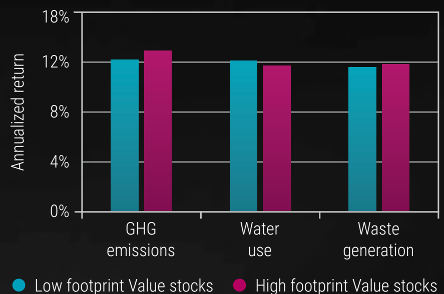
Avoid value stocks with high environmental footprint

- Asset-heavy sector and companies cause the value premium to have a poor environmental footprint
- Decarbonizing value allows to fully capture the premium while significantly lowering three footprints
- This enhanced Robeco value definition lowers the risk of investing in climate-related potential value traps

Environmental footprint of generic and decarbonized value



Return comparison of low versus high footprint value stocks



Source: Robeco Quantitative Research. The left graph shows the average environmental footprint (GHG emissions, water use, and waste generation) of the highest value quintile portfolio minus the lowest value quintile portfolio as a percentage of the footprint of the equally-weighted universe for the conventional and 'decarbonized' book-to-price value variable. A positive number means that the value stocks have a larger footprint than the non-value stocks. The right graph shows the average returns in USD of the highest and lowest environmental footprint quintile portfolios within the highest quintile value quintile portfolio. Holding period is 12 months. Portfolios are monthly rebalanced. The sample period is January 1986 to December 2018. The stock universe is MSCI All Country World Index constituents supplemented with large off-benchmark stocks.

70 bln AuM
(As of 31 December 2022)

In quantitative equities
More than half classified as SFDR 8 + SFDR 9

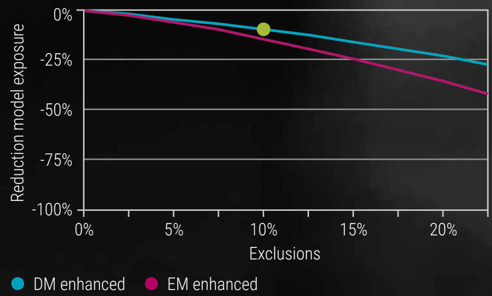
Best of both worlds

In-depth sustainability integration helps us to find the sweet spot. A considerable improvement of the ESG profile of portfolios can be achieved while keeping the factor premia almost untouched. A 30% footprint reduction while keeping >95% of the factor exposure.

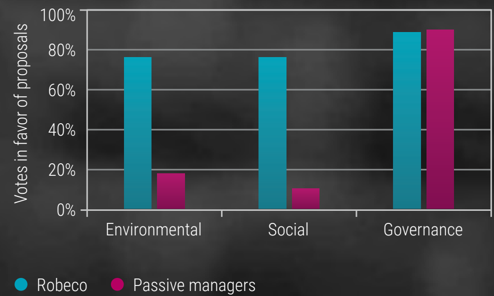
Voting and engagement that changes the corporate agenda

- Robeco research: passive managers mostly vote against environmental and social proposals
- This means passive investors mostly don't support proposals that aim to change sustainability characteristics of companies

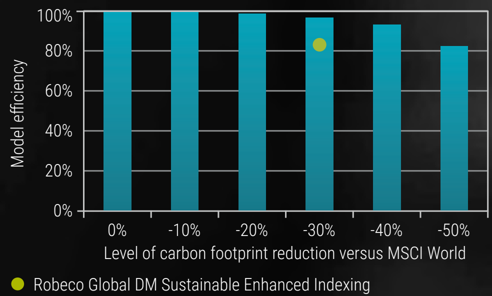
Enhanced indexing model efficiency at various levels of exclusions



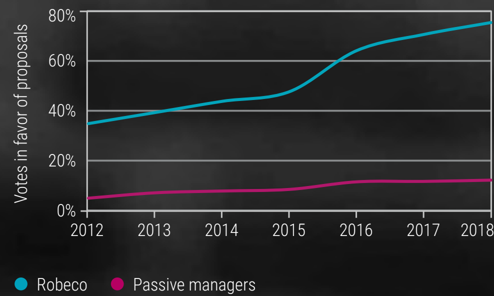
Voting of asset managers in favor of ESG proposals
(2018)



Enhanced indexing model efficiency at various levels of carbon footprint reduction



Votes of asset managers in favor of environmental and social proposals



Source: Groot, de, W., Koning, de, J. and Winkel, van, S. (2021), Sustainable voting behavior of asset managers: Do they walk the walk? The Journal of Impact and ESG investing. Summer 2021, https://doi.org/10.3905/jesg.2021.1.021. The top-right graph shows the percentage of votes in favor of environmental, social, and governance proposals by the 'big three' passive managers (BlackRock, Vanguard, and State Street) and Robeco in 2018. Data is based on over 500,000 votes cast on ESG proposals in the first half of 2018. The bottom-right graph shows the percentage of votes in favor of environmental and social proposals of the big three passive managers and Robeco. Data is based on over 100,000 votes cast on environmental and social proposals by the big three passive managers and Robeco in the sample period (January 2012 through June 2018).

About Robeco

A leader in sustainable investing

Robeco is an international asset manager offering an extensive range of active investments, from equities to bonds. Research lies at the heart of everything we do, with a 'pioneering but cautious' approach that has been in our DNA since our foundation in Rotterdam in 1929. We believe strongly in sustainable investing, quantitative techniques and constant innovation.

Developing superior solutions requires an innovative nature and a pioneering spirit. That's why we nurture a culture in which new ideas are welcomed and embraced, from investing in Peru in 1930 and Hong Kong in 1968 to launching our first sustainable fund in 1995. Robeco has over 1,000 employees and offices in 16 countries all around the globe.

Today, we are a pure-play global asset manager and a leader in sustainable investing, with a strong range of client propositions in quant, thematic, credits and emerging market investing. We push our boundaries because we know that we provide greater value to our clients if our innovation is grounded in research.

We are a leader in sustainable investing. We've routinely integrated ESG across all our investment processes since the early 2000s, we are frontrunners in active ownership, and we continuously push the boundaries of impact investing.

But leadership in sustainable investing can only exist if it's research-driven, integrated across our investment universe, and rooted in our behavior. We have a clear net-zero commitment and understand that sustainability is not an abstract concept but part of our daily lives.

Our mission is to enable our clients to achieve their financial and sustainability goals by providing superior investment returns and solutions.

The journey – sustainable investing has come a long way

Investors seek both returns and sustainability in the pursuit of wealth and well-being. We now travel a road in which the focus is not just on achieving financial returns, but also on how investments impact society. Robeco has been at the forefront of sustainable investing (SI) for decades and is deeply committed to leading the way forward. Over the years we've developed the skills and tools to enable you to invest in the best possible and sustainable way to create wealth and well-being.

From its humble origins in the 18th century, sustainable investing is now a multi-trillion dollar industry. As it went from niche to mainstream, the number of tools and ways in which to invest sustainably has grown enormously. SI ranges from basic exclusions to more advanced climate solutions as the asset management industry works towards achieving net-zero emissions by 2050. This means there are a lot of options to consider.

Five steps into sustainable investing

With so much to choose from, it is important to have a clear view on your own goals and convictions to make sure your investment solutions match your sustainable preferences. These five steps can help.

1. Select your goal

Think carefully about your goals. Are you mainly focused on maintaining a particular PR image, or are you trying to improve your risk-adjusted return? Do you want to make a difference with binding impact goals pursuing something like the SDGs? Or do you have very specific targets regarding climate change? Different goals need different strategies and solutions.

2. Choose a strategy

A sustainable strategy should fit your sustainable goals. Exclusions, for example, can be the only element or a building block of a broader approach. ESG integration allows for a more meaningful approach, and impact investing is best if you want to make sure your investments have the clearest positive impact, or feel strongly about targeting specific goals such as investing in the energy transition. Most investors choose a mixture of strategies, often on an add-on basis.

For instutional clients there's also the option of co-creating your own strategy. Customized madates are an important building block in our sustainable quant equity solutions.

3. Include voting and engagement

Always make sure you use your rights as a shareholder or bondholder to influence corporate behavior. This means voting at shareholder meetings and using engagement; if you don't have your own capacity, both can be outsourced. Active ownership can be very effective, especially when shareholders join forces to effect change on bigger issues.

4. Select and monitor

While most asset managers have a sustainable offering, make sure you look under the hood properly. Is sustainability truly embedded in the organization and across their business or do they only integrate sustainability for selected strategies? What is their UN PRI score? What are the SFDR classifications of their products? Monitoring is also important. Check whether known standards such as TCFD are used.

5. Build towards the future

We strongly believe in achieving both wealth and well-being. The world faces many big challenges and everyone needs to contribute to meet these successfully. Think, for example, of investment solutions that can contribute to the Paris Agreement, help restore and protect biodiversity, address the SDGs or protect human rights. Think of real-world impact. Think of a sustainable future.

Sustainable investment solutions

There are several ways to rank and subdivide sustainable investment strategies. One is the SFDR classification (Article 6, 8 or 9), which indicates the degree of sustainability. Another way to look at sustainable investments is to subdivide the offerings under larger themes. For example, Robeco has climate investment strategies, strategies based on the SDGs and specific thematic solutions.

Below we highlight some of these strategies in each category.

CLIMATE

- **RobecoSAM Net Zero 2050 Climate Equities** is an actively managed strategy that invests in stocks in developed countries across the world with a goal of decarbonization towards net zero. The aim is to reduce the carbon footprint of the portfolio and thereby contribute towards the goals of the Paris agreement to keep the maximum global temperature rise well-below 2 ˚C.
- **RobecoSAM Climate Global Bonds** is an actively managed strategy that invests in bonds globally. It aims to reduce the carbon footprint of the portfolio and thereby contribute towards the goals of the Paris agreement to keep the maximum global temperature rise well-below 2 ˚C. The strategy invests in worldwide bonds and other marketable debt securities issued by OECD member states and by companies based in OECD countries.
- **RobecoSAM QI Global SDG & Climate Beta Equities** is an actively managed strategy that invests globally in stocks of companies that advance the UN Sustainable Development Goals (SDGs) and pursue a carbon-reduction objective. The selection of these stocks is based on a quantitative model. The portfolio is built on the basis of the eligible investment universe and an internally developed SDG framework for mapping and measuring SDG contributions.

SDGs

- **RobecoSAM Global SDG Engagement Equities** is an actively managed strategy that invests in a concentrated selection of global stocks. Stock selection is based on fundamental analysis to invest in companies based on their contribution to the UN SDGs. There will be active engagement with the invested companies and a dialogue to motivate these companies to improve their fulfilment of the UN SDGs over three to five years via active engagement.
- **RobecoSAM Global SDG Credits** is an actively managed strategy that invests in corporate bonds in the global developed and emerging markets. Its objective is to provide long-term capital growth. The strategy will not invest in assets with a rating lower than B- by at least one of the recognized rating agencies. It takes into account the contribution of a company to the UN SDGs.

THEMATIC

- **RobecoSAM Smart Energy Equities** is an actively managed strategy that invests globally in companies providing technologies for clean energy production, distribution, power management infrastructure and energy efficiency. The strategy integrates sustainability criteria as part of the stock selection process and through a theme-specific sustainability assessment.
- **RobecoSAM Smart Mobility Equities** is an actively managed strategy that invests globally in companies involved in the transformation and decarbonization of the global transportation sector. The portfolio is built on the basis of an eligible investment universe that includes companies whose business models contribute to the thematic investment objectives.
- **RobecoSAM Biodiversity Equities** is an actively managed strategy that invests in stocks of companies which support the sustainable use of natural resources and ecosystem services to help reduce biodiversity loss. The portfolio is built on the basis of an eligible investment universe that includes companies whose business models contribute to the thematic investment objectives. The assessment regarding relevant SDGs uses an internally developed framework.

For more investment solutions visit our website.

Important information

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Colophon

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