



Seven steps to ESG integration — the Robeco approach

WHITE PAPER

For professional investors

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Introduction

Sustainability is a long-term driver for change in markets, countries and companies, which in turn can impact future performance. Based on this belief, we consider sustainability to be one of the value drivers in our investment process, similar to the way we look at financials or market momentum.

So how do we integrate it in our investment processes for fundamental and quant equities and the fixed income range? There is no right or wrong way to do it – all professional investors will approach it differently. In this white paper we outline our own ‘seven-step’ process to integrated sustainability.



Sustainability investing is here to stay

The concept of investing sustainably began in the 1970s, though its true origins date back even further as objections to slavery in the 18th century: in 1758, the Religious Society of Friends (the Quakers) barred its members from participating in the slave trade. In the later 20th century, religious objections to certain forms of investment that were considered unethical took a different vein. Christian groups controlling shareholdings refused to investing in the shares of companies making products which became known as 'sin stocks', led by alcohol, tobacco and gambling – introducing the concept of exclusions.

Sustainable investing also emerged as an environmental crusade in the 1970s to try to preserve the earth's resources. Pressure groups such as Greenpeace and Friends of the Earth began to pressure governments and companies to cut pollution, recycle waste and look for alternative sources of renewable energy away from fossil fuels.

The sustainable movement gained force in the 1980s with the World Commission on Environment and Development (WCED), which became known as the Brundtland Commission after its first chairman, former Norwegian Prime Minister Gro Harlem Brundtland. She was appointed by Javier Pérez de Cuéllar, Secretary General of the United Nations, in December 1983. Its mission was to "unite countries to pursue sustainable development together" in an effort to combat uncontrolled use of natural resources by emerging markets, led at the time by extensive deforestation. The Brundtland Commission was dissolved in December 1987 after releasing 'Our Common Future', also known as the Brundtland Report.

The document is notable for having coined the phrase 'sustainable development', which it defined as follows: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

In the 1990s, the concept of sustainable development turned into 'sustainable investing'. At first, investors struggled to define it: former definitions have included 'ethical investing', 'green investing', and the wider 'socially responsible investing (SRI)'. In moving from a niche concept to a mainstream strategy, a broader and more inclusive brush was used. A new acronym was coined to better describe the mission of investors: to consider Environmental, Social and Governance (ESG) factors in how government or companies operate before deciding whether to buy their stocks or bonds. The European Sustainable Investment Forum

(Eurosif), a pan-European organization dedicated to promoting sustainability in financial markets now defines integrated sustainability investing as:

“... the explicit consideration of ESG factors alongside financial factors in the mainstream analysis of investments. The integration process focuses on the potential impact of ESG issues on company financials (positive and negative), which in turn may affect the investment decision.”



As global challenges remain large, and continue to shape markets, integrating sustainability information is more and more important for investors. This white paper will focus on integrated sustainability, and specifically in how Robeco does this across the entire investment process. This can be narrowed down into ‘seven steps’, or stages, from defining an investment belief, to raising the bar in conjunction with international developments in ESG.

The seven steps to integrated sustainability

1. Defining your investment belief

Sustainability is a true commitment and an explicit strategic choice for Robeco. It is our firm belief that it leads to better-informed investment decisions and enhances returns in the long term.

This commitment is significant, and growing: the use of sustainable investing principles is now reflected in EUR 79 billion of assets under management out of the EUR 137 billion in total under management at 31 March 2017.

Defining an investment approach always starts with defining investment beliefs and goals. This is no different for sustainability investments. These goals will then determine the practical application of the defined beliefs within an investment portfolio. Should companies be excluded because they breach the UN Global Compact's principles, or do you believe in inclusions and engagement? Eurosif provides a distinction between three different investment goals that can be applied simultaneously. These are:

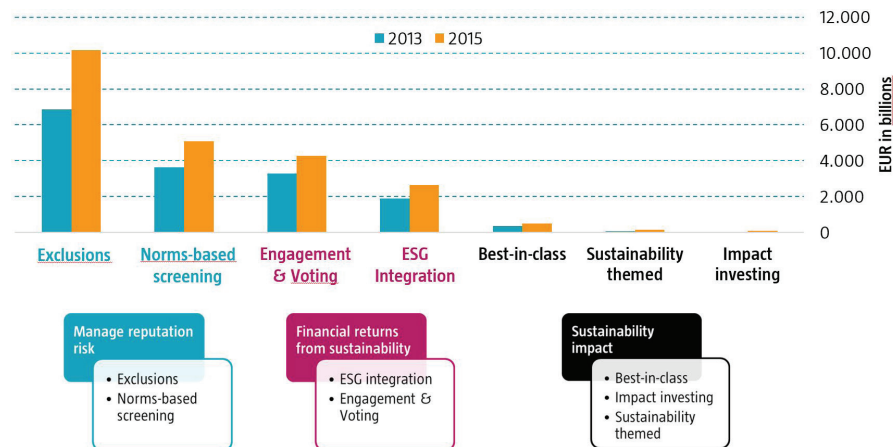
- Managing reputational risk: for some investors this is still their fundamental definition of what sustainability investing means. This is usually done through 'norms-based screening' – choosing investments according to their compliance with international standards and norms, or through exclusions.
- The financial returns from sustainability: achieved through ESG integration i.e. the explicit inclusion of ESG into financial analysis and investment decisions, based on a systematic process and appropriate research sources, and through active ownership led by engagement and voting.
- The impact of sustainability on portfolios: done through the best-in-class approach; impact investing, where holdings are bought specifically to be able to generate a social and environmental impact alongside a financial return; and through thematic investing targeting assets such as renewable energy.

The variety in sustainability investing approaches



Source: Eurosif European SI study 2016

The relative popularity of these approaches; exclusion remains the most common



Source: Eurosif European SI study 2016

As an asset manager at heart with many clients across the globe, for Robeco the focus lies on the financial returns from sustainability. And at the bedrock lies a founding principle – that everything we do is backed by exhaustive research. As our first director Wim Rauwenhoff said back in 1929: “Every investment strategy should be research-driven.” Because we see sustainability as a long-term driver for change in markets, countries and companies, which in turn can impact future performance, our core beliefs are:

- Integrating ESG factors into investment analysis and decision-making processes leads to better-informed investment decisions
- As an ‘early warning radar’ for risks that are not yet reflected in asset values, its use improves risk/return ratios
- Considering ESG factors therefore leads to more comprehensive assessments and valuations, resulting in earlier discovery of investment opportunities.
- Exercising ownership rights through voting and engagement enables us to create additional long-term value while also taking responsibility as an asset owner.

“Putting in place a good process in line with our beliefs clearly goes well beyond screening and engagement, and implies the use of ESG information in all stages of the investment process, including the investment case and the valuation models used in investment decisions,” says Masja Zandbergen, head of ESG integration at Robeco. This is elaborated upon in subsequent chapters.

International sustainability frameworks

Aside from the Eurosif definition, and the core principle that all sustainability investing is about improving ESG in some way or another, there is no real 'catch-all' in how it should be applied. For asset owners, it is often clearer who the end-client or beneficiary is; they could be beneficiaries of a pension fund for a certain industry, for example. It can then be determined what common values this group of people or the organization have. For global asset managers with a multitude of different clients and clients' clients, this can be more challenging. Internationally accepted frameworks like the UN PRI and the UN Global Compact can be meaningful generally accepted values to adhere to. Robeco subscribes to many initiatives and codes. Three of the leading frameworks are:

The UNPRI: Robeco has been a signatory of the United Nations Principles for Responsible Investment (UNPRI) since 2006. The UNPRI is an international network of more than 1,600 investors working together to further the growth of sustainability investing. It has six core principles, led by a commitment to using environmental, social and governance (ESG) factors in the investment process. Taking these Principles seriously can, in turn, seriously enhance your reputation. In July 2016, both Robeco and RobecoSAM retained the highest possible A+ score for sustainability investing by the UNPRI for the second year running.



Global Compact: Robeco has also been a signatory of the UN Global Compact since 2014. The Compact describes itself as "a call to companies to align strategies and operations with universal principles on human rights, labor, environment and anti-corruption, and take actions that advance societal goals". It has 10 principles set out in four areas regarding human rights, labor market participation, a responsible policy towards the environment, and anti-corruption measures.



ICGN: Robeco belongs to the International Corporate Governance Network, a body of investment professionals dedicated to improving the 'G' in ESG. Corporate governance can have many facets, from encouraging companies to improve diversity and the quality of boards, to critically considering remuneration policies and board independence. ICGN members manage assets worth more than USD 26 trillion.



The seven steps to integrated sustainability

2. Embedding
it in the
organization;
the multiplier
effect

Integrated sustainability cannot work without management commitment from the top down. Once that is in place, more employees can become involved on an increasing basis, creating a 'multiplier effect' that eventually results in everyone playing their part.

“The tone from the top is extremely important,” Zandbergen says. “It won’t work without a mandate from the board, backed by the firm’s own stakeholders, and a clear message communicated internally that this is how the company sees its investing future.”

Involving the portfolio managers and analysts in setting up a solid ESG integration framework is also essential. In some cases, this may mean changing an entire investment mindset, requiring a clear framework to be created and then implemented. In order to achieve this, there should be a clear focus on financial materiality, Zandbergen says. While sustainability investing does remain a broad concept, the rationale for portfolio managers should be clear: otherwise it becomes a ‘box-ticking approach’.

So, integrated sustainability means integrating people as well as numbers. The integration of sustainability is not one team at Robeco sitting in one room, but a team effort across the whole company. In each team, one of the portfolio managers or analysts is designated as an SI specialist. These SI specialists have been extremely important in setting up the ESG integration frameworks and are important in developing our capabilities further. Ideas, trends and opportunities are shared in a monthly meeting. A new ‘open desk’ policy at our new head office in Rotterdam makes this a lot easier. The ability to sit anywhere according to the daily workload needs has further promoted the integration of ideas, and not only in sustainability investing.

The ESG integration frameworks that are part of the regular investment processes are a good way of ensuring that all analysts and portfolio managers get involved. In the next part we will elaborate on our integrated sustainability framework, and how it leads to engagement from everyone.

The seven steps to integrated sustainability

3. Creating
an integrated
sustainability
investing
framework

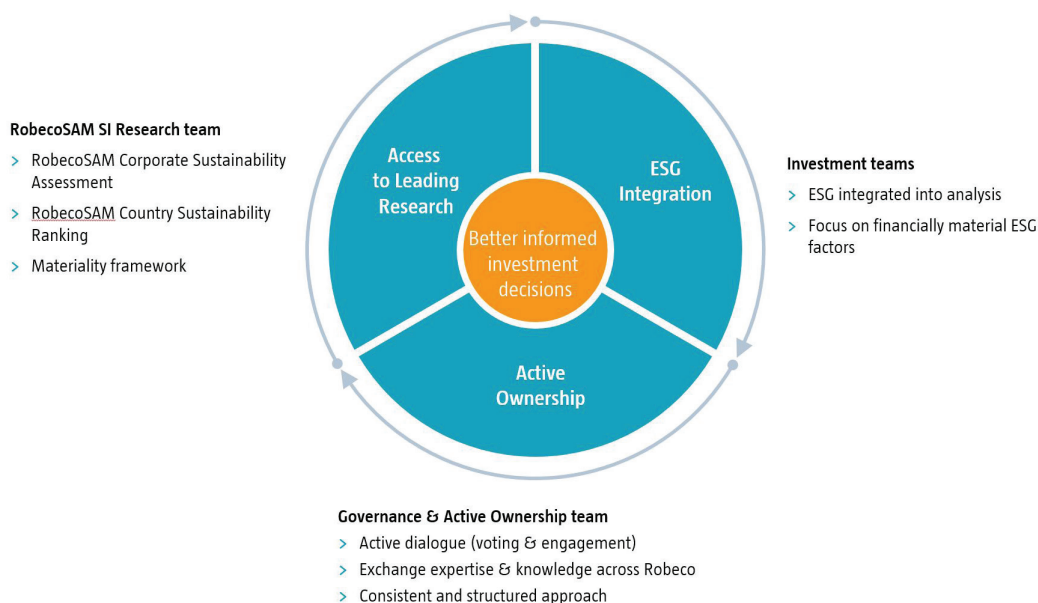
The integrated sustainability investing framework is enshrined in three important pillars within Robeco: a research capability, the investment teams and the Active Ownership team.

Our process of integrated sustainability can be summarized as follows:

- We have access to the leading sustainability research of RobecoSAM, our sustainability specialist based in Zurich, which forms the basis of our knowledge.
- The investment teams are responsible for making sure ESG is integrated in their own processes when deciding which securities to buy.
- We have a bespoke Active Ownership team whose members specialize in different areas, including engaging with companies and voting at shareholder meetings.

Having access to high-quality research enables the investment teams to make better-informed investment decisions, which then empowers the Active Ownership team to have equally high-quality conversations with companies with sustainability challenges, backed by a track record proving that it works. These conversations in turn could lead us to improve the research on companies' sustainability strategies to be used in the investment teams, creating a virtuous circle shown in the diagram below:

The virtuous circle: the integrated sustainability investing framework at Robeco



The seven steps to integrated sustainability

4. Having
access
to leading
research

Access to research is led by the use of RobecoSAM's proprietary Corporate Sustainability Assessment (CSA) and Country Sustainability Ranking (CSR). These respectively focus on industry and country-specific issues that drive the long-term growth and profitability. Both are proprietary models and world-leading in their own right.

Our leading information on companies...

The CSA is an annual survey of the world's largest or most influential companies; a detailed questionnaire with more than 100 questions is sent to more than 3,400 companies, of which more than 800 gave their answers in 2016, allowing their sustainability credentials to be accurately assessed. RobecoSAM expresses its research in a sustainability score (0-100), which reflects a company's relative sustainability performance versus its peer group. Relevant information is also summarized in qualitative company profiles. Robeco's (and RobecoSAM's) investment teams have access to both the scores and sector overviews, with company profiles made by the sustainability analysts which are then specifically tailored to the investment processes.

... and on countries

The CSR is a biannual survey of the ESG credentials in which 62 countries – 22 from developed and 40 from emerging markets – took part in 2016. It reveals the most sustainable countries in the world (Scandinavia has provided more countries in the top five than any other region) and also the worst. The CSR gives an ESG score for countries based on 17 indicators. These indicators have been selected according to their availability, materiality, plausibility and financial relevance by the fixed income portfolio managers in co-operation with RobecoSAM. The scores on these factors are based on over 200 underlying data series. The selection of indicators as well as data sources are subject to ongoing reviews as this is an integral part of our model maintenance process. The rankings are maintained in collaboration between RobecoSAM and Robeco's fixed income portfolio managers.

ESG weights in the CSR, from environmental factors to social unrest and aging populations

E 15%	Environmental status	10%
	Energy	2.5%
	Environmental risk	2.5%
S 25%	Social indicators	10%
	Human development	10%
	Social unrest	5%
G 60%	Liberty & inequality	10%
	Competitiveness	10%
	Political risk	10%
	Aging	10%
	Institutions	5%
	Six other factors	15%

Source: RobecoSAM.

RobecoSAM

Founded in Zurich in 1995 as Sustainable Asset Management, RobecoSAM is an investment specialist focused exclusively on sustainability investing. It offers asset management, indices, impact analysis and investing, engagement, voting, sustainability assessments, and benchmarking services.

Asset management capabilities cater to institutional asset owners and financial intermediaries and cover a range of ESG-integrated investments (in public and private equity), featuring a strong track record in resource efficiency themed strategies. Together with S&P Dow Jones Indices, RobecoSAM publishes the globally recognized Dow Jones Sustainability Indices (DJSI).

Based on its Corporate Sustainability Assessment (CSA), an annual ESG analysis of over 3,800 listed companies, RobecoSAM has compiled one of the world's most comprehensive databases of financially material sustainability information. The data of the CSA is also included in EUR 79 billion of assets under management by the subsidiaries of the Robeco Group.

RobecoSAM is a sister company of Robeco. Both entities are subsidiaries of the Robeco Group, whose majority shareholder is ORIX Corporation. As a reflection of its own commitment to advocating sustainable investment practices, RobecoSAM is a signatory of the UNPRI and a member of Eurosif, ASrIA and Ceres.

Focus on financial materiality

All Robeco's SI research is focused on financially material ESG issues. A 2015 study by Harvard Business School directly linked the use of material ESG issues to higher share prices for the first time. The working paper by Mozaffar Khan, George Serafeim and Aaron Yoon entitled 'Corporate Sustainability: First Evidence on Materiality', made a clear case for the financial benefits feeding through into asset values.

"This study has provided striking evidence that the stock market returns of companies that perform well on their material ESG issues have also tended to exceed the returns of otherwise comparable companies whose performance on such issues is below average. This strengthens our belief in analyzing material ESG issues" Zandbergen says.

"An investor can potentially assess a company's sustainability across hundreds of criteria, and indeed many factors will need to be scanned to avoid red flags. But only a few are important enough to be considered a likely determinant of a company's future business model, and hence its stock performance. Such highly material issues vary not only among industries, but even among companies within the same industry."

“For example, when looking at banks, putting a lot of effort into assessing how much CO2 emissions, water consumption or paper consumption the bank has is time not well spent, since there is no link between these environmental factors and the banks’ long-term business models. We would rather spend time looking at the banks’ corporate governance, risk management and culture, and cyber security, as these are more impactful. For a utility or energy company, however, CO2 emissions are extremely important factors, and their impact both on long-term business models and wider society can be very large.”

While RobecoSAM remains the main source of data and research, Robeco analysts also have access to data from Sustainalytics, RepRisk, Glass Lewis, Shareholder Support Services and brokers as external providers of sustainability data, plus more mainstream sources such as Bloomberg and standard news media.

“Having access to relevant and leading research on ESG is one of the most important success factors in the integration process,” says Zandbergen.

The seven steps to integrated sustainability

5. ESG integration: each investment process requires its own approach	Armed with their research, the investment teams are responsible for integrating financially material ESG information into all stages of the investment process. This could be done by quantifying the impact of ESG elements on traditional metrics such as sales and margin growth, or by taking ESG performance into account in the credit analysis.
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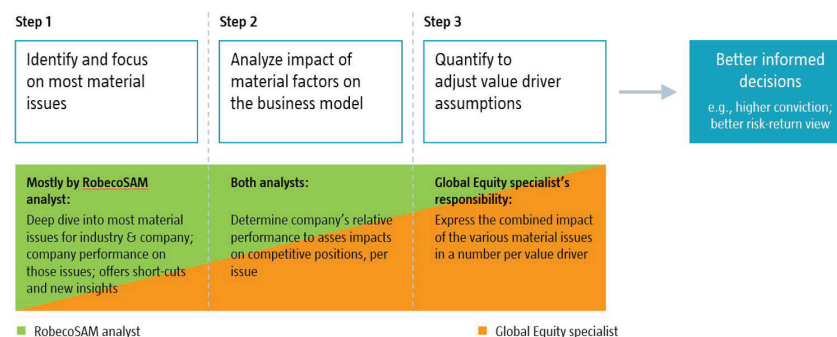
ESG factors are integrated into the investment process for equity (for both developed and emerging markets), fixed income and private equity at Robeco.

Below we firstly elaborate on the ‘value driver adjustment’ approach of the global equity team, then show how ESG is integrated in fixed income funds – corporate and government bonds – and finally how it pertains to private equity.

Global equities

Robeco’s global equity team uses the value driver adjustment approach. This ties into traditional valuation approaches by linking ESG factors to value drivers through their expected effects on business models and competitive positions. The starting point of this linking process is having a clear understanding of the nature of the business and its most important stakeholders, which in turn should allow the analyst to identify the most material issues. This is shown in the diagram below:

The steps taken by the Global Equities team members in integrating ESG research



Source: Robeco.

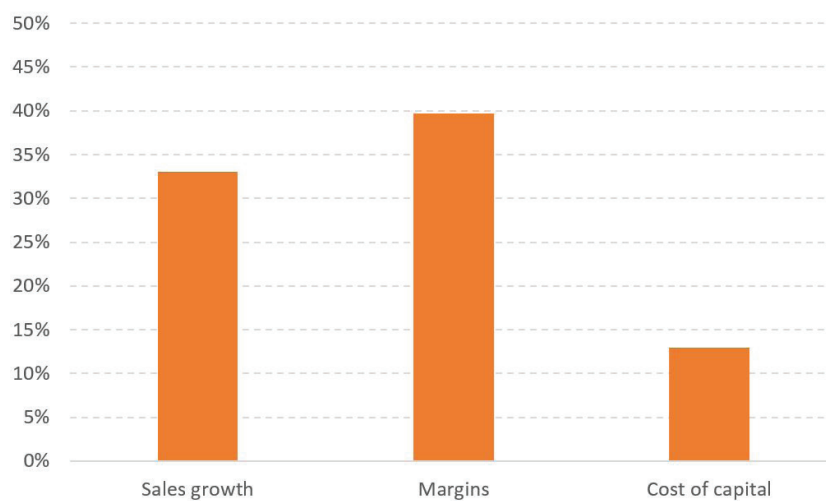
Having identified such issues, the sustainability investment analyst then assesses how the company performs on these issues relative to its peers based on indicators, policies, strategy, and other considerations. He or she then determines if the company derives (or will derive) a competitive advantage (or disadvantage) from its most material issues, and how that advantage affects its value drivers, both current and forecast.

Such an approach is not without its own challenges; the links between ESG factors and value are hard to prove statistically, or capture in an algorithm. But the underlying intuition is compelling and straightforward: if a company derives a competitive advantage from its ability to manage an ESG issue, that advantage should become visible in its value drivers.

That is, the company should in the end have higher sales growth, higher margins, more efficient use of capital, or lower risk. These value drivers in turn drive the return on invested capital and valuation of the firm.

Since the beginning of 2014, Robeco's analysts explicitly quantify the expected impacts of material ESG issues on the value drivers in their discounted cash flow analysis. This resulted in over 200 investment cases using an integrated ESG approach. "In analyzing the investment cases we found that the average impact of the ESG information on valuation is almost 4%, ranging from about -40% to + 60% for companies that have products that either contribute to solutions to global ESG problems or exacerbate them," Zandbergen says. "The most material issues are innovation management, corporate governance, supply chain management and environmental management."

The frequency of the value driver impact: margins and sales are mainly adjusted once it is applied



Source: Robeco.

Emerging market equities

The ESG integration process for the fundamental emerging market equities strategies is comparable to this. However, as a top-down allocation to countries is an important performance driver, the macroeconomic aspects of the various countries involved are also an important input. A key part of the fundamental analysis consists of comparing the economic, political and social strengths of emerging markets. This evaluation includes issues such as a country's transparency, political stability, progress toward basic democratic principles and the protection of shareholder rights. From a bottom-up perspective, many ESG factors are considered to be strong leading indicators of long-term earnings, and are therefore incorporated in the valuation as described above.

Example of integrated sustainability: quantitative equities

Along with sustainability, Robeco has also been a pioneer in quantitative investing, where anomalies in markets can be exploited using factors such as Low-Volatility, Momentum, Value or Quality. ESG integration is useful for quantitative strategies too.

“A key feature of our approach is that companies with a favorable ESG score have a higher chance of ending up in the portfolios as we ensure that the portfolio’s ESG score is at least as strong as that of the benchmark or reference index,” says Michael Strating, Head of Quantitative Equity at Robeco.

“We want to avoid the risk of being overexposed to less sustainable companies, and our empirical results show that our approach does not have negative impact on risk/return characteristics. Exposure to unsustainable companies at the portfolio level would pose a risk, as certain sustainability risks could materialize in the future. Empirical analyses show that the improved sustainability profile can be achieved while maintaining the same attractive exposure to the quantitative model factors. Stocks with corporate governance issues or major litigation or regulatory risk may be excluded from the investable universe.”

“So we consider the integration of sustainability factors a form of prudent risk management,” says Strating. “This is in line with our general risk management philosophy to avoid all risks which are not rewarded with higher returns.”

Fixed income: credits and government bonds

The prime goal of integrating ESG factors in our analysis for **corporate bonds**, or credits, is to strengthen the ability to assess the downside risk potential of our credit investments. Two factors are important when it comes to integrating ESG factors within credits. First of all, the impact must be financially material. Before concluding whether ESG factors contribute positively or negatively to our fundamental view, there must be a tangible impact on factors like margins, revenues, risk profile, etc. Secondly, the focus is mainly on detecting downside credit risk.

Robeco’s credit analysts express a view on what they think of the company’s fundamentals, aggregated in what we call the F-score. This view is built on five building blocks: business position, strategy, ESG factors, financial position, and structure. The analyst discusses the five pillars – including ESG – in a credit research report. This report is discussed in a credit committee where the final fundamental view is determined. The fundamental view is expressed in an ‘F-score’ which ranges from -3 to +3. Combining the F-score with the relative value results in the investment recommendation.

In 2016, for all names under coverage (High Yield, Emerging, and Investment Grade), we found that in 30% of the cases, ESG information had a financially material negative impact versus 5% with a positive impact on the fundamental view. In 2015, these numbers were 24% and 8% respectively. Subsequently, in 65% of the cases ESG factors do not have a financially material impact.

This methodology is used in all credit-related strategies. So for every credit we invest in, the impact of ESG factors on the fundamental credit quality is assessed. For our dedicated Euro Sustainable Credits fund we go a step further by using a best-in-class approach, whereby only the top 50% ranked names (based on RobecoSAM scores) qualify as eligible investment candidates. We also measure the company's environmental footprint in terms of CO2 emissions, electricity and water use, and waste levels. Our aim is to have a more sustainable footprint than the benchmark; furthermore, we are also now tapping the rapidly expanding market for green bonds, in which 8% of the fund is now invested. In 2016, the assets invested in Euro Sustainable Credits fund and mandates increased to more than EUR 1 billion.

F scores are vital to the approach for credits, of which the ESG score is an important component

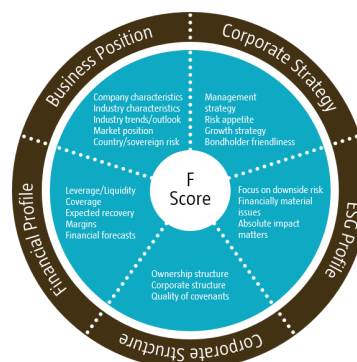
Making the extra step to find out all company information

Building blocks:

- > Business position
- > Strategy
- > Financial position
- > Corporate structure
- > ESG profile

Credit analysts assign:

- > Fundamental score [-3 to +3]
 - > Opinion on an issuer's relative credit fundamentals and expectations given its rating, across sectors
- > Investment recommendation (Underperform, In Line, Outperform)
 - > Opinion on valuation in relation to its fundamentals



Source: Robeco

For **government bonds**, the prime goal for integrating ESG factors into analysis for sovereigns is to enrich the knowledge on individual countries and strengthen the country selection process.

To build a longer-term perspective and prepare investment decisions, we construct country reports. The ESG profile of a country is always part of these reports. Incorporating this type of information in the investment analysis gives us additional information that is not easily

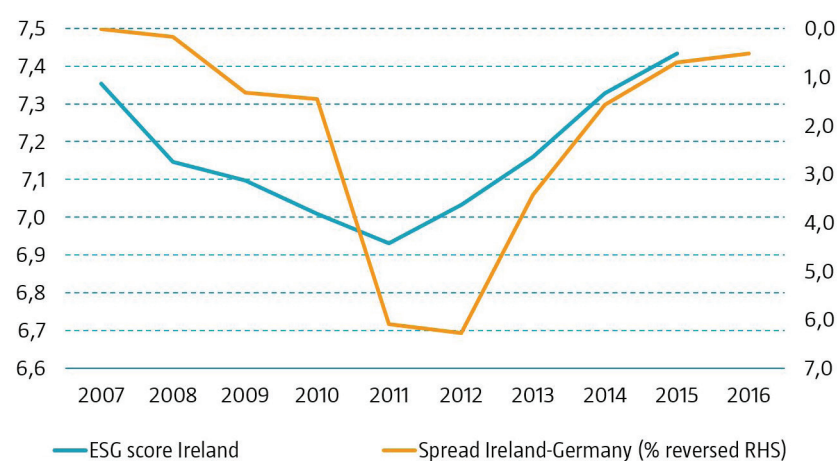
available via other data sources. Our practical experience is that ESG information has often proved to be a valuable addition to traditional debt analysis.

The output of the ESG analysis always results in a score for each of the countries in the investment universe. Changes in the scores and the resulting ranking act as flag for development that could be relevant for our investment process. As part of our investment decisions we write an investment thesis. In such a thesis the ESG risks or opportunities are a standard element. The ESG information is especially valuable for decisions regarding country allocation.

Its usefulness cannot be understated: “The CSR acts as an early-warning system which helps us to spot problems as well as opportunities in countries well before they are reflected in spreads, or are picked up by the rating agencies,” says Rikkert Scholten, portfolio manager at the rates team at Robeco.

“There are substantial differences in the ESG credentials of individual countries. These differences have had an impact on the positioning in our fixed income funds. For example, for most of 2016, we had an overweight position in Irish government bonds. Ireland’s ESG performance is above average, with a score of 7.2. The score is weaker on energy dependence, but the country benefits from a robust governance framework and enjoys a favorable political and social climate. Ireland also enjoys a well-developed welfare system that has not only helped to maintain social cohesion, but also its readiness to accept painful and needed structural reforms. This, in turn, has contributed to Ireland’s remarkable recovery from the financial crisis and its status as the euro area’s growth leader during recent years.”

Using ESG scores for Ireland



Source: RobecoSAM

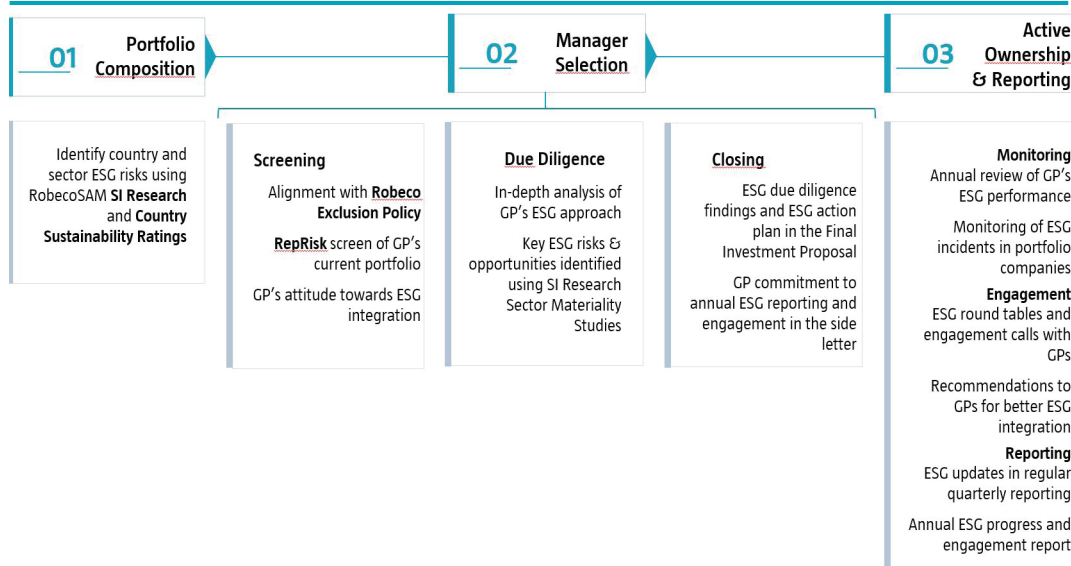
Private equity

Sustainability principles are also incorporated in the investment process of Robeco Private Equity in 2004 when the Sustainable Private Equity fund-of-funds program was launched. Annual monitoring of the ESG activities of the private equity managers was begun as part of this program. This monitoring provides the necessary information for the assessment of the ESG performance of the managers and their funds, and it is a vital input for our structured engagement program. The purpose of this program is to improve the ESG performance of the participating managers so that they will integrate ESG considerations in a structured and formalized way, and be able to report on their results. A crucial part of our engagement process have been feedback and recommendations for improvements that we provide to the managers annually.

In 2016 we started using the PRI Reporting Framework and online tool for the collection and assessment of ESG information from the private equity managers. We monitor how the managers have formalized their ESG approach, and how they are implementing it in their investment practices. The assessment tool also enables us to benchmark the performance of the managers in our ESG program against the broader group of private equity firms that are PRI signatories. It also helps us monitor the performance of our own ESG engagement program over time.

Next to this pro-active engagement, Robeco Private Equity has introduced a more reactive engagement based on ESG incidents that take place in the portfolio companies of the participating managers. For this purpose we use RepRisk. This tool provides us with ESG alerts that we further investigate and assess the necessity to ask for additional information and response from the relevant managers.

The process for ESG integration in Robeco Private Equity



The seven steps to integrated sustainability

6. Using
active
ownership
to enhance
performance

Active ownership is an important pillar of our approach to sustainability investing. Here we use Robeco's position as an asset manager and therefore as a stock or bondholder to seek improvements in the ESG performance of investee companies, and to take responsibility.

The goal of the engagement efforts is twofold: to create additional long-term value by focusing on financially material issues, while also taking responsibility as an asset owner.

“Key elements in our assessment of corporate governance practices include the management’s view on shareholder rights, accountability and transparency,” says Carola van Lamoën, head of the Active Ownership team. “While voting is an effective means of changing corporate behavior, on a continuous basis, we use engagement to improve ESG behavior at companies by entering into constructive dialogues with their managements over the issues that we feel need to be tackled.”

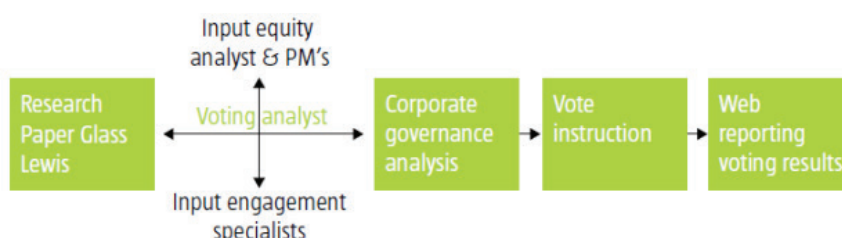
All publically listed companies are owned by their shareholders, who have the power to shape policy by voting on resolutions at shareholder meetings. Shareholders can also put items on the agenda and insist that companies debate sustainability issues, even if the company does not support the requested changes.

Voting policies: Robeco’s voting policies are based on the principles of the International Corporate Governance Network (ICGN), which provide a broad framework for assessing companies’ corporate governance practices. The ICGN principles allow companies to be assessed according to local practices, national legislation and corporate governance codes of conduct. Key elements in our assessment of corporate governance practices include the management’s view on shareholder rights, accountability and transparency. In addition, Robeco pays close attention to adequate and independent supervision.

We exercise voting rights for our retail and institutional clients, and provide proxy voting services for many institutional clients. Currently, we vote on behalf of clients at approximately 5,000 meetings per year. Voting is coordinated by the Active Ownership team, with specialists who have expert-level knowledge of corporate governance.

Our voting execution process can be summarised in the following chart, from receiving research from Glass Lewis on what is coming up at shareholder meetings, to final reporting of how we voted so that clients and other stakeholders are informed. The whole process is summarized in the following graphic:

The voting process



Source: Robeco

Engagement: We use engagement to increase long-term shareholder value. We do this by entering into constructive dialogues with the companies in which we invest. Through this dialogue, we encourage them to improve their environmental, social and governance practices. Our approach includes corporate governance topics, such as improving shareholder rights and board quality, environmental topics such as energy transition, and social topics like cyber security and data privacy.

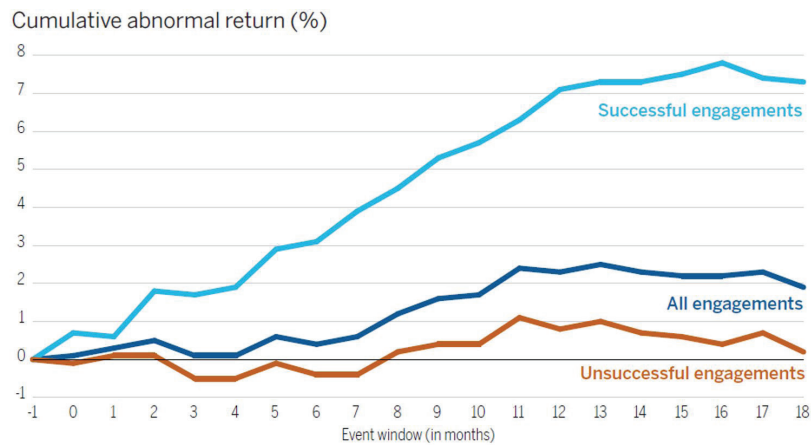
Engagement has proved highly effective, particularly once companies realize that it is in their own interests to improve; better ESG ultimately means lower costs and better risk management that will feed through to the bottom line.

Dealing with fossil fuel companies is another example of where engagement is crucial as the world grapples with climate change. This has the potential to create stranded assets – where companies cannot burn the oil, gas or coal that they extract due to global warming limits – along with wasted investment in upstream exploration. The long-term answer is to change business models to replace fossil fuel extraction with renewables. It is particularly important because here, divestment is not the simple answer. Divesting ultimately means that if one asset owners sells, for example, a coal company holding, then another one buys it, simply transferring the problem without addressing the underlying issue.

Robeco's five main engagement themes for 2017 are 'Quality and product management in the automotive industry'; 'Culture and risk oversight in the financial industry'; 'Corporate governance standards in Asia'; Climate change strategies and carbon emissions management in office real estate industry'; and 'Social risks of sugar'.

The sustainability analysts, the financial analysts and the active ownership specialists all work together to define the relevant research needs, target companies to engage with, and often jointly speak to the companies.

How engagement brings outperformance



Source: Dimson, Karakas and Li (2015). Fama-French size decile returns from Professor French's website.

Exclusion: As a last resort, exclusion can be applied. Robeco's exclusion policy and the list of companies involved can be found on the website.

Leveraging engagement across the organization: the biopharma case

Integrated sustainability is a team effort at Robeco, and an excellent example of how it is put into practice can be seen in an engagement program with major drugs companies.

An interdisciplinary working group of five Robeco and RobecoSAM specialists have conducted engagement research into the ESG risks and opportunities of the biopharmaceuticals industry, a topic that is highly material for investors. During the three-year program we will engage with 11 major (bio)pharmaceutical companies, including AstraZeneca (US), Roche (Switzerland) and Novo Nordisk (Denmark).

The core issue is how the global burden of disease is being tackled, at a time when the global healthcare system is experiencing increasing pressure. This is being mainly caused by four factors: aging populations; the ensuing increase in chronic diseases in the developed world; austerity measures in Europe; and a flawed incentive system in the US. At the same time, increasing access to healthcare in emerging markets is a critical need, as two billion people still have insufficient access. The result is an imbalance between healthcare needs and the funding required to meet them.

A solution that is increasingly being discussed is value-based healthcare: the delivery of the best outcomes to patients at the lowest cost. To achieve this, product providers' incentives need to be aligned with patients' interests. Biopharmaceutical companies play an important role, as they control unique products that can greatly alleviate the burden of disease.

For this engagement, we are focusing on five of the most material issues that contribute to sustainable value creation: access to medicine; clinical trial transparency; innovation management; product quality management; and business ethics. The insights gained in the course of the engagement will be integrated into the various analyses and investment processes across Robeco and RobecoSAM.

And it can be shown to feed through to better outcomes for those involved. For example, a healthcare company recently turned out to score very well on innovation management. Robeco's Global Equity team analyst subsequently increased the stock price's upward potential in his investment case, while the team's credit analyst adjusted his credit view from negative to neutral. At RobecoSAM, the sustainability investing analyst raised the company's corporate sustainability score, while the equity analyst improved his view on the company, which he discussed with the portfolio managers of RobecoSAM's core and thematic funds.

So, by ensuring that all information is shared across the organization, we can therefore leverage optimally on our engagement efforts.

The seven steps to integrated sustainability

7. Raising the bar as global challenges continue to shape markets

Even though the financial industry has made progress in incorporating ESG in some form or other in their investment portfolios, global ESG challenges are still large. Therefore, the bar is being raised all the time as we seek to achieve higher standards across the SI spectrum, and then assessing the impact on investments.

Global developments in sustainability are happening fast, and companies and asset managers need to rise to the challenge. These kinds of developments range from top-down measures as governments and regulators introduce new legislation or regulations to enforce more sustainable practices, to bottom-up moves in which established orders are being challenged.

From the global perspective, Sustainable Development Goals (SDGs) are making a big impact on companies and asset managers, and Robeco takes these goals very seriously. Furthermore, whereas Europe seemed to lead the field in sustainability, Asia is very quickly upping its game, and the US is catching up as well. This development is partly driven by the introduction of Corporate Governance and Stewardship codes.

SDGs

In the autumn of 2015, SDGs were released by the United Nations as a successor to the Millennium Developing Goals (MDGs), which expired in 2015 and had achieved good results on improving education levels and health, reducing hunger and alleviating poverty. The 'Agenda for Sustainable Development' has been adopted by 193 countries, which together agreed to contribute to the realization of 17 SDGs by 2030. These 17 goals range from ensuring the availability of water and sanitation for all, along with achieving food security and gender equality, to accessing affordable and sustainable energy within 15 years.

The SDGs differ from the MDGs in that they call on the public AND the private sector to cooperate with the signatory governments to tackle the most serious issues facing both people and planet. The financial industry, with its ability to direct capital towards sectors that offer the biggest opportunities to contribute to the SDGs, has a special role to play.

Robeco is a signatory to the Sustainable Development Goals Investing (SDGI) Agenda, an initiative of the Dutch financial sector. This states our commitment to contribute to the SDGs, as we consider them to be catalytic drivers for positive change. The extent to which companies contribute to realizing the SDGs is valuable information that we can incorporate into our investment process, and it strengthens our investment decisions. In addition, via active ownership, we use our influence as an investor to encourage companies to contribute towards meeting the SDGs, while at the same time improving the investment performance for our clients.

Examples of how Robeco contributes to SDGs through its engagement

Robeco contributes to SDGs through its engagement programs. For example, the engagement theme 'Environmental Challenges in the European Electric Utilities Sector' actively encourages electricity utilities to implement ambitious environmental strategies. It also aims to persuade them focus on de-carbonization (independently of their historical energy mix) which means moving from coal to gas to renewables, and using meaningful internal carbon prices in their planning.

By encouraging 12 utilities to shift from coal to gas to renewables, we contribute to the realization of SDG 7 - Renewable Energy. During our engagement so far we have already seen substantial changes taking place in the sector. Two German utilities, for example, have drastically adjusted their business models in order to focus on renewable energy.

The 'Social Issues in the Food & Agri Supply Chain' engagement theme is an example of how we encourage companies in the food industry to work towards meeting the SDGs by considering smallholder capacity building and investing in its development. We encourage companies to support the development of the communities in which they operate by providing job skills training and education on agricultural techniques. This contributes to the achievement of SDG 1 - No Poverty – and SDG 2 - No Hunger.

Through our 'Board Quality' and 'Good Governance' engagement themes, we contribute to SDG 5 - Gender Equality. In these engagement programs we encourage companies to create well-balanced boards in terms of gender, age and skills.

Stewardship codes

From a bottom-up perspective, stewardship codes are changing established cultures. A good example of this can be seen in the Stewardship Codes now being introduced around the world in trying to improve corporate governance. Begun in the UK in 2010, when the first internationally recognized stewardship code was produced by the Financial Reporting Council, their principal aim is to make institutional investors more active in the corporate governance of their investee companies. The first stewardship code built on the UK Corporate Governance Code, whose legal basis is enshrined in the Financial Services and Markets Act 2000.

The 2010 code contains seven principles, including a requirement for investors to publicly disclose their policy on how they will discharge their stewardship responsibilities and voting responsibilities. One striking facet of the stewardship code is the "comply or explain" policy which requires asset managers to announce on their websites if they have not followed one of the principles, and explain why. Fearful of reputational damage, most investors are careful to follow the codes as closely as possible.

A good example of how stewardship codes are gaining in value can be seen in Japan, a country in which governance has notoriously been weak for decades. The country suffers a lack of independent (non-executive) directors on boards and has been poor in dealing with minority shareholders, among other problems. The country introduced a stewardship code in 2014, and an engagement program was subsequently started by Robeco and other investors at investee Japanese companies to try to apply it as widely as possible.

“We believe that improvements in corporate governance practices can improve transparency and effective oversight, and further align the company’s practices with the interests of minority shareholders,” says engagement specialist Michiel van Esch, who has led the program. “Such changes would protect Robeco’s investments in Japanese companies, and contribute to stronger financial results.”

Regional variations: the US

These regional variations in how sustainability is practiced also present issues for investors such as Robeco with global clients. Europe has tended to lead the field in sustainability investing, but Asia is gradually catching up. So is the US, which traditionally has not been as prominent in sustainability investing as its stature might ordinarily suggest, with fewer laws over issues such as investing in cluster bombs, and a reliance on shale gas which has been proven to have adverse environmental effects. The US also places more of an emphasis on quarterly reporting, leading to short-termism, but this is slowly changing.

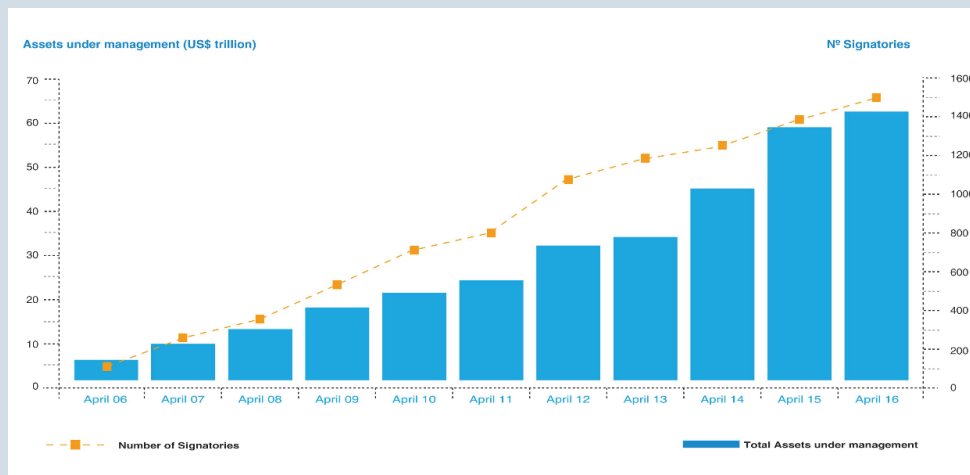
In its 2016 Report on US Sustainable, Responsible and Impact Investing Trends, the US Forum for Sustainable and Responsible Investment (USSIF) reported that the level of SI had risen to USD 8.7 trillion, up by 33% on 2015. However, it still only accounted for one-fifth of all investment under management in the US, and certain issues remain, the group said. Meanwhile, fears grow that combatting climate change will become more difficult if new President Donald Trump pulls out of the COP 21 agreement.

“Money managers and institutional investors are scrutinizing an array of concerns – including climate change, weapons production, human rights and corporate political spending and lobbying – across a broader span of assets than in 2014,” says USSIF Chief Executive Lisa Woll in the summary of the 2016 report. “A diverse group of investors is seeking to achieve positive impacts through strategies such as corporate engagement or investing with an emphasis on community, sustainability or the advancement of women.”

The landscape

Sustainability investing has come a long way since Robeco first started doing it in the 1990s. Growth in sustainably managed assets is now outpacing the increase in total professionally managed assets. As the chart below shows, assets under management by members of the UNPRI has grown exponentially in the last 10 years, rising from about USD 5 trillion in 2006 to more than USD 60 trillion in 2016, the last full year for which figures are available. This has risen in tandem with the UNPRI's growing membership, up from just a few hundred when it was founded to over 1,600 in 2017.

Assets under management



With almost 59% of investments being managed sustainably, Europe still heads the pack. At the other end of the spectrum is Asia, with just under 1%. However, across this region the landscape is beginning to evolve as well, in part driven by the increasing awareness of the massive capital needed to finance the region's transition to a low-carbon future. New stewardship codes have been introduced in Taiwan, Malaysia, Japan and Hong Kong.

Conclusion

In conclusion, sustainability investing starts with defining an investment belief and embedding it in the organization, and then integrating it through a framework. We firmly believe that this integrated approach leads to better-informed investment decisions.

To ensure consistency, Robeco uses a Message House as a means of making sure the same principles are applied throughout the company. It becomes a “living document” which is constantly updated with latest developments. Our core Message House statement is this:

‘Robeco adopts a holistic approach to integrating sustainability into investment decisions. Sustainability is a long-term driver for change in markets, countries and companies which in turn can impact future performance. Based on this belief, sustainability is considered as one of the value drivers in our investment process, similar to the way we look at financials or market momentum. In our fixed income investment processes sustainability is seen as a good indicator to protect the downside risk. In our equity investment processes Robeco sees it also as a driver for outperformance next to a protection of the downside risk.

This integrated approach to sustainable investing recognizes the importance of ESG integration across asset classes, reflected in EUR 79 billion of Assets under Management. From an investment perspective, considering material ESG factors strengthens our investment process and ultimately leads to a better-informed investment decision. Robeco has incorporated ESG criteria as part of the investment process since 1999.

Our integrated sustainability approach is based on three key elements – leading sustainability research, ESG Integration and active ownership. Our sustainability investing specialist, RobecoSAM, through its Corporate Sustainability Assessment and Country Sustainability Ranking, focuses on industry/country-specific issues that drive long-term growth and/or profitability. Robeco incorporate these insights into most of our investment strategies in a tailored way to generate better risk-adjusted returns for our clients. With our active ownership approach we work with our companies to improve their performance on ESG and enrich our ongoing research.’

We’ve been doing it now for two decades, and we’ve never looked back.
Please visit our website for topical information on **Integrated Sustainability**.

Case studies

So how does this work in practice?
Here are three examples of how ESG
is used for investment decisions in
the automotive, banking and mining
industries.

Auto industry business models are set to change



A good example of how engagement is needed to be able to navigate a rapidly changing industry can be seen with autos. The business models of global automotive industry players will significantly change in the coming years as car use is transformed. The sector faces major ESG challenges, prompting Robeco's Governance & Active Ownership team to make engaging with the auto industry one of its priorities for 2017.

"We believe the business models of car makers will need to adapt to the potentially wide-ranging use of electric vehicle batteries, along with the rise of shared mobility solutions," says Sylvia van Waveren, senior engagement specialist at Robeco. "And all this is going on while the sector is becoming more digital, attracting new entrants such as Google and Uber proposing their own solutions."

"As investors, we need to know how car makers will deal with these challenges in their industry, how they will address the huge risks, and how they plan to profit from the opportunities that arise. This will allow us to pick the winners of this transformation."

Currently, very few players in the auto industry meet Robeco's sustainable investing criteria, says Global Equities analyst Jurriaan Hofman. "We focus on companies that can generate strong or increasing returns on invested capital and cash flow in a sustainable manner. If a company meets these criteria, it should provide a sound base for long-term viability. Additionally, it should deliver outsized investment performance if we can buy such companies at an attractive valuation."

"However, within the automotive industry we currently find only a small number of companies that meet these criteria. Most of them are suppliers of auto components that have a competitive advantage, either through technological know-how or cost leadership. Typically, we prefer to invest in suppliers over the auto manufacturers."

Industry faces four themes

Hofman says the auto industry is facing four themes that will affect its future sustainability scores, and therefore its investibility by Robeco. First and foremost is the move towards greener cars, particularly New Energy Vehicles led by electric cars and hybrids. This is partly being led by regulations over emissions, with some governments planning to phase out combustion-engine powered vehicles in the coming decades.

Secondly, there is the move towards making cars safer, with more in-car features such as automatic braking and parking assistance, using new digital camera technology. Thirdly, we see growing consumer demand for self-driving vehicles, though this awaits government approvals for public use. Finally, new business models such as Uber are leading the growth in consumer services such as car sharing.

“We certainly see a long-term trend towards increasing ‘electrification’, and in particular, a shift in auto sales towards hybrid cars,” Hofman says. “This trend is particularly favorable for the companies that provide the technology for electrification.” “However, we believe the electrification trend mostly presents challenges for the auto manufacturers. At the moment, the production costs of hybrid and electric cars are higher than the costs of producing a traditional car. Moreover, most consumer are not willing or able to pay for these extra costs. This situation makes it difficult for auto manufacturers to earn sufficient profits on the sale of hybrid and electric vehicles.”

More opportunities for suppliers

Making cars safer and more ‘intelligent’ is largely an opportunity for auto industry suppliers such as Delphi, Sensata Technologies and Mobileye, Hofman says. “Cars are becoming equipped with an increasing number of ‘active safety’ features: you can for instance think about self-parking cars, and automatic brake assistance,” he says. “This means the market for active safety products is already growing very fast. Despite that, it is likely going to take many more years before we will see a significant share of ‘fully autonomous driving’ cars on the roads because of legal and technological challenges.”

Self-driving cars and the rise in car sharing services are largely a profit opportunity for technology enablers such as companies that supply sensors, software and electrical architecture rather than the auto manufacturers, Hofman says.

“Car-sharing could indeed pose a threat to future car sales, but its impact is likely to be mitigated by other factors. Many consumers who use a car-sharing service may not have used a car if they would have had to buy one. Additionally, the more intensive use of shared cars leads to more wear and tear on the vehicle, and thus the quicker the vehicle needs to be replaced by a new one.”

Engagement themes

For the G&AO team, the issue is fundamentally trying to improve ESG metrics as the industry develops. “Short-term operational challenges such as ever-rising fuel efficiency requirements and many recalls, sometimes at very high costs, raise question marks about the industry’s efforts in ensuring the highest product quality,” Van Waveren says.

“At the same time, the auto industry has to answer fundamental questions related to their future product offerings, and how quickly they want to shift from internal combustion engines to plug-in hybrids, and ultimately to electric vehicles.”

Have we built better banks since the financial crisis?



The importance of applying ESG as a means of risk management can be seen in the banking industry. There are few sectors that have come so close to disaster, primarily because basic risk metrics were ignored.

Since the global financial crisis, we see clear improvement in risk management and oversight at banks, says Taeke Wiersma, co-head of credit research, who co-authored a white paper on the subject entitled: 'Risk management and risk oversight: have we built better banks?'

He says capital levels have been boosted and leverage has come down. "However, there are still many banks that do not incorporate any risk management metric into remuneration and incentive plans," he says. "Investors should therefore continue the dialogue with banks on this topic."

In its 2009 report on the lessons learned from the financial crisis, the OECD stated: "Perhaps one of the greatest shocks from the financial crisis has been the widespread failure of risk management. Boards were in a number of cases ignorant of the risk facing the company."

"Without proper risk management there cannot be proper banking," says Wiersma. "It is imperative that investors feel comfortable with a bank's risk management track record and framework. Senior executives need to communicate to the capital market how risk categories impact capital allocation. The Board is the ultimate body that has to monitor risk management and investors need to have enough reassurance about the level of Board expertise and the strength of risk management committees." To assess the development of risk management, Wiersma and his colleagues analyzed the RobecoSAM dataset for global developed markets banks on their risk management scores. This was done for 28 banks from Europe, 23 from North America and 17 from the Asia-Pacific region over 2011-2016. The report drew the following conclusions:

- European banks consistently have the highest risk management scores over 2011-2016
- North American banks have shown some strong momentum, particularly over 2014-2016.
- Asia-Pacific banks lag behind, as many Japanese banks are underperformers. The major Australian banks are part of the risk management 'super league'.

The study also looked at the risk-weighting of bank assets. Robeco's analysis showed that European banks started deleveraging in 2008-2009, whereas it took Asia-Pacific banks another three years. North American banks actually increased their risk-weighted assets from 2012 onwards.

Risk management from a governance perspective

Robust risk management ideally goes hand in hand with strong corporate governance. The three-lines-of-defense model is widely known, capturing three levels:

- The business operations: business risks that are taken need to be in line with the bank's risk policy.
- The oversight function: This comprises various functions such as finance, compliance and risk control. Banks have strongly increased investments in this area, partly driven by regulatory demands. It is important that the second line of defense is independent from the first line. There should be controls on an ongoing basis. The bank needs to have a clearly defined oversight structure in terms of roles, responsibilities and accountability.
- Independent assurance: the third line of defense has to do with risk assurance, both within the internal audit function and from independent assurance providers (think of the large accounting firms). Excessive tenure of the auditors would raise a flag in the sense that they might be too comfortable.

Executive Officers

In looking at the role of senior executives, the results showed that sufficient risk management expertise has to be available on the Executive Committee, and the Chief Risk Officer (CRO) needs to be sufficiently senior.

The study analyzed a collection of 12 international banks and the research showed that most banks have appointed a new generation of CROs since the global financial crisis. Half of the CROs in the sample had prior internal experience in risk management. In only two out of our twelve banks, the CRO had experience in risk management outside the current organization.

And the average experience in risk management is about nine years, which just includes the global financial crisis experience. In most cases shorter risk management tenure tends to coincide with no or limited prior risk management experience in the own organization – a potential red flag.

Board of Directors

Many Boards now recognize the importance of risk management and have set up committees to focus on this, says Wiersma. "Elements we find important are that bank Boards use dedicated and standalone risk committees, or a hybrid form. The risk committees should be independent and their members should have acquired enough risk management and general financial expertise in and outside the current organization."

"We found that a stand-alone risk committee is the dominant model. The committee was fully independent in seven out of 12 banks. The least desirable situation is where a former CEO is Chairman of the Board and also Chair of the risk committee. In two cases the former CEO was member of the risk committee. We would strongly advise against this."

“In only 15% of the cases, did the members of the risk committee have relevant expertise. In five out of 12 cases no one on the risk committee had relevant expertise.”

Another important issue is the degree to which risk management metrics are part of the bank executives’ scorecard, he says. “With the exception of HSBC, none of the banks in our sample had some sort of risk management metric as part of their Long-Term Incentive Plan (LTIP). The balance between S(hort)TIP and LTIP should receive more attention as it can be seen as a good proxy for risk management. For example, large STI awards relative to LTI encourage gaming and short-term risk taking.”

Towards a continuous dialogue

So, have we built better banks? “Yes, in the sense that banks have built better risk management and oversight structures,” Wiersma concludes. “Capital levels have been boosted and leverage in the system has declined.”

But... “No, in the sense that many banks still do not incorporate any risk management metric into their incentive plan. Investors should continue the dialogue with banks, asking the right questions about risk management and risk oversight. Let’s build better banks together!”

Research shows link between ESG and profitability in mining



Evidence that the use of ESG does feed through to the bottom line was seen in a study showing a clear link between sustainability criteria and the profitability of mining companies.

The study was done by Jaap Smit, a senior portfolio manager in the Robeco credits team, and Iva Koçi, a research associate. They analyzed the use of environmental, social and governance (ESG) factors at companies engaged in the copper, iron ore and gold extraction industries. We analyzed three aspects: the impact of recycling; the degree of country risk; and the link between a miner's greenhouse gas emissions and its cost base.

Robeco has long viewed sustainability as a long term-driver of companies' performance. So the first issue we tackled was recycling, which has always been positive for ESG. In the metals industry, the further development of countries like China can lead to more secondary recycled material coming onto the market, and this is now competing with primary-sourced material from the mining industry.

Recycling remains stable

For copper, the recycling input rate has been stable over the last decade. Global copper demand is expected to rise by 2% per year, and recycling is expected to follow the same trend. As a consequence, the recycling input rate is foreseen to remain stable in the 30-35% range.

China, the world's largest market for copper, has tended to favor primary sourced copper concentrate over a secondary, recycled supply. However, falling copper prices mean the relatively cheap price of concentrate is hindering significant new investment in recycling. More demand combined with higher copper prices would be a better environment for more recycling capacity to come online.

A similar pattern can be seen in iron ore. Scrap iron is integrated into ore production through Electric Arc Furnaces (EAF) as an alternative method of steelmaking to blast furnaces. New EAF capacity is now only being built in Saudi Arabia, because of the country's low construction costs and proximity to ports.

Gold recycling is different because production levels are closely related to the gold price and economic indicators. In periods of distress, gold prices go up due to the safe haven effect, and so there is a higher incentive to sell gold for recycling. If we enter an economic crisis again, we expect to see higher recycling rates in gold coming back.

The conclusion is that the recycling of these three metals will remain rather stable in the near term and will not impact primary supply.

Country risk is important

The second topic concerns the degree of country risk involved in the mining of these three metals, which has a direct bearing on decisions to invest in the relevant companies. We constructed a tailor-made country risk index considering four components: environmental policy, political stability, institutional framework and competitiveness.

‘Gold miners tend to operate in riskier countries’

For this we use the RobecoSAM Country Sustainability Ranking, which evaluates countries via a structured framework covering a broad range of ESG factors. Our research shows that gold operations involve greater ‘tail risk’, followed by copper and iron ore. This is because gold miners tend to operate in riskier countries, since the geological deposits are often found in less stable regions.

The opposite is true for iron ore, which is mainly mined in more stable countries. Nevertheless, one should be careful not to generalize, as iron ore can be also found countries such as Liberia, and gold in countries such as the US and Canada.

Greenhouse gas costs

The third topic looked at the link between greenhouse gas emissions and a company’s cost base. One issue is the ‘stripping ratio’ – the amount of material required to extract a ton of ore – which is directly related to the energy and water intensity of the operations involved. For instance, deep underground mining operations that have long haulage distances and a large stripping ratio consequently generate significantly higher greenhouse gas emissions. The question is whether more emissions also imply a higher cost base.

We collected information from corporate reports and data from the Carbon Disclosure Project on pure copper, iron ore and gold miners. We found a significant positive relationship between miners’ cost base and emissions per unit of production of iron ore, copper and gold. The relationship is most significant for iron ore, where lower emissions mean lower costs.

For investors, we therefore regard emissions per production unit as a valuable indicator to assess miner competitiveness. On top of that, from a portfolio perspective, investors should allocate their money not only to competitive low emission mining companies but also to a mix of assets with lower country risk when possible.

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