Environmental Finance

Green Bond Funds

Impact Reporting Practices 2020

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Executive summary

Growing awareness of the potential of the fixed income market to finance the commitments made under the Paris Agreement on climate change and the 2030 Agenda for Sustainable Development has led to dramatic growth in green bond issuance.

New issues in 2020 are expected to exceed $270 billion, up from $175 billion just two years ago. Increasing interest from mainstream investment institutions, such as pension funds and insurance companies, is helping to drive this growth and dozens of funds have been launched in the past three years to facilitate their access to the market.

A key recommendation of the Green Bond Principles (GBP) – which underpin the market – is that issuers should report on how the bond proceeds are used and the environmental impact achieved. It is therefore to be expected that investors will want green bond funds to report on the environmental impact of their portfolios. Indeed, most institutional investors – not just those investing in green bonds – are under mounting consumer and regulatory pressure to disclose more about the sustainability of their investments.

In response to these developments, *Environmental Finance* decided to examine how green bond funds are reporting their environmental impact and to what extent their reports meet the needs of their investors.

We identified 55 funds that allocate, or intend to allocate, at least 50% of their assets to green bonds and, in September 2020, we sent them all an online questionnaire. Responses were received from fund managers responsible for 38 funds. A complementary questionnaire was sent to asset managers and asset owners and responses were received from 21 major green bond investors. This report is based on the responses we received, 30 follow-up telephone interviews and our own research of publicly available information.

Although several different labels have been introduced to describe various types of bonds that finance sustainable development projects – with Covid-19 having triggered particularly rapid growth in social and sustainability bonds – we restricted our survey to labelled green bonds.

These are defined by the International Capital Market Association (ICMA) as bonds whose proceeds "will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects and which are aligned with the four core components of the GBP".

The Principles explicitly recognise several categories of eligible projects: climate change mitigation, climate change adaptation; natural resource conservation; biodiversity conservation; and pollution prevention and control.

We restricted our survey in this way because most of the funds we examined define themselves in terms of their exposure to labelled green bonds and because the metrics for measuring the environmental impact of such bonds are more precisely defined than those for social and sustainability bonds.

If the current trend towards social and sustainability bonds continues, however, we may in future surveys attempt to cover funds investing heavily in these instruments.

Some of the funds we contacted have been buying green bonds for more than 10 years while many others are relatively new to the market. Our survey concentrated on the 49 funds that we confirmed had been operating for more than 12 months. Three-quarters of them already have some form of impact reporting.

Just as the funds vary considerably in size and maturity, so their impact reports differ widely in terms of format, frequency and the level of detail they provide about how they estimate the environmental impact of their portfolios.

But all of them face the same fundamental challenges of collecting data from bond issuers and aggregating it to form the basis of the fund's own impact report. Many fund managers told us that data collection is a time consuming, mostly manual task which does not always result in sufficient data being gathered.

Several of the smaller funds said the time and resources required to gather impact data from issuers is a major barrier to extending the scope of their impact report.

Even large funds said it is usually necessary to be pragmatic and concentrate on the impact information which is readily available and focus on a representative share of their portfolio rather than aim for exhaustive coverage. But some investors complained that it is not always clearly stated what proportion of the portfolio is covered in a fund's report.

Having collected the data, the next major challenge is to aggregate it in such a way as to give a meaningful assessment of the environmental impact of the fund's portfolio. This can be a major task, because of the wide array of metrics, methodologies and baselines used by bond issuers.

› Key findings

- More than two-thirds of investors regard impact reports as 'crucial'
- 60% of investors say current impact reporting practices are 'inadequate'
- Most investors prefer standalone impact reports rather than integrated reporting
- Key areas for improvement are transparency and standardisation of the reports
- More than 80% of green bond funds monitor the ESG ratings of issuers
- 74% of green bond funds already issue impact reports; a further 16% intend to do so
- Two-thirds of funds report in line with the Harmonized Framework for Impact Reporting
- 90% of fund impact reports discuss their portfolio's alignment with the SDGs
- Key metrics (for both funds and investors) are GHG reductions, clean energy generated and energy efficiency gains
- 70% of funds expect to include additional impact metrics in future reports

Even the most commonly reported metrics – greenhouse gas emissions reduced or avoided and MWh of renewable energy generated – are reported in a variety of ways. Different funds then aggregate this data in different ways, depending on the composition of their portfolios and the resources they have available. Several funds outsource some of this work to third parties.

It should be noted, however, that there is broad agreement between green bond funds and investors on the key metrics that are of most interest.

But there is clearly much room for improvement, as 60% of the investors who responded to the survey said they consider current impact reporting to be "inadequate". This applies to both direct and indirect investments via funds. Few investors made any significant distinction between the quality of impact reports from green bond funds and that from bond issuers.

This is not surprising, as less than a third of the investors surveyed allocate more than 10% of their fixed income portfolio to green bonds and the vast majority of this is in the form of direct purchases in the primary market. Several investors said that green bond funds represent such a tiny proportion of their AuM, that they do not commit much time to their reports at the moment.

However, as all the investors surveyed said they intend to increase their green bond investments and the number of green bond funds is rising rapidly, we expect to receive more granular feedback on funds' impact reporting in our follow-up survey in 2021.

A key improvement investors wish to see is greater standardisation in impact reporting across the green bond market.

The ICMA *Harmonized Framework for Impact Reporting* (see page 6 and 7) is a significant step towards simplifying and standardising impact reporting and provides practical templates and instructions for issuers to help them produce comparable reports.

These guidelines are widely used and several other frameworks have been proposed to improve the consistency of reporting by bond issuers. But, as yet, there is very little guidance for fund level reporting or resources to help the aggregation process.

By casting a light on the immature but fast growing universe of green bond funds, we hope to stimulate further debate between bond issuers, funds and their investors, leading to more useful impact reporting.

Improvements in the transparency and consistency of impact reporting should give fixed income investors more confidence in green bond funds and thus lead to more capital flowing into projects that tackle some of the most pressing challenges facing the planet.

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The authors would like to thank Jean-Marie Masse, chief investment officer, Financial Institutions Group, IFC, for his support. He explains the importance of the project: "Green bond issuances have grown sharply since the 2015 COP 21 and the signing of the Paris Agreement. Green bonds are designed to channel funding, at scale, to mitigate the risks of climate change by financing projects which will reduce greenhouse gas emissions, for example. A measure of success of these instruments is that investors' demand is exceeding the supply at present.

"Green bonds are now part of the so-called 'thematic bonds' family which includes social, sustainability and sustainability-linked bonds, and more innovation in that space should come in the near future. Since green bonds form the more mature and the largest volume of thematic bonds, it is timely to research the relevance and quality of content of green bond-specific information disclosed to investors and assess investors' expectations.

"These findings can guide market innovation and growth since greater standardisation of information disclosure will increase the efficiency in the interactions between issuers, investors, and other stakeholders such as digital databases, service providers and consulting firms. At this stage, taking stock on where current market practices stand is a very valuable exercise."

Environmental Finance

Environmental-Finance.com is an online news and analysis service established in 1999 to report on sustainable investment, green finance and the people and companies active in environmental markets.

We have been covering the green bond market since its inception in 2007 and now offer a comprehensive database of labelled green, social and sustainability bonds. This Bond Database was recently expanded to accommodate green loans and sustainability-linked loans, in recognition of the growing importance of loans in the sustainable debt market.

For further information, please contact Phil Manley phil.manley@fieldgibsonmedia.com or Tony.Gibson@fieldgibsonmedia.com

Sustainability reporting – casting a light on impact

Reporting on how the proceeds of green bonds are used is a key recommendation of the Green Bond Principles (GBP) which underpin the market.

These voluntary, but influential, guidelines say the reporting should be annual and should include a list of the projects to which proceeds have been allocated, a description of the projects and the amounts allocated, and their expected environmental impact.

As the market continues its rapid growth – with new issues likely to exceed $270 billion this year, up from about $175 billion just two years ago – a growing number of mainstream institutional investors are joining the market, many of them via green bond funds.

Environmental Finance research revealed 49 funds that allocate, or intend to allocate, more than 50% of their assets to green bonds, as of October 2020, with at least 6 more funds newly launched or preparing to launch.

In light of the importance attached to the reporting of environmental impact by the GBP (see box below), it is likely that investors will expect green bond funds to report on the impact of their portfolios.

Indeed, most institutional investors – not just those investing in green bonds – are under pressure to disclose more about the sustainability of their investments.

› The Green Bond Principles

The Green Bond Principles (GBP) are voluntary guidelines to improve transparency and disclosure and thus promote the integrity of the green bond market. They have four core components:

- Use of Proceeds
- Process for Project Evaluation and Selection
- Management of Proceeds
- Reporting

In terms of reporting, the GBP recommend the use of qualitative performance indicators of the expected environmental impact and, where feasible, quantitative performance measures (e.g. energy capacity, electricity generation, greenhouse gas emissions reduced/ avoided, number of people provided with access to clean power, decrease in water use, reduction in the number of cars required, etc.). In addition, they ask for disclosure of the key underlying methodology and/or assumptions used in the quantitative determination.

Issuers that are able to monitor *achieved* impacts, rather than estimating *expected* impacts, are also encouraged to include those in their reports.

Voluntary guidelines aiming at a harmonised framework for impact reporting have been developed for energy efficiency, renewable energy, water and wastewater projects, and waste management projects. (See page 7) These guidelines include templates for the format of impact reporting at a project and a portfolio level that issuers can adapt to their own circumstances. Guidelines for additional sectors are under development.

Regulatory pressure to report

For example, the EU's Sustainable Finance Action Plan, adopted by the European Commission in March 2018, aims to encourage more private finance towards investments that support the Paris Agreement target of a carbon-neutral economy by 2050 and, more broadly, the UN Sustainable Development Goals (SDGs).

It calls for greater transparency about how sustainability risks are factored into investment decisions and, from 31 December 2021, companies offering investment funds, pensions and other investment products will have to report the extent to which their products align with the EU's new classification system for sustainable activities – the EU Taxonomy.

In a related initiative, the UK recently announced that it would make it mandatory for banks, insurance companies, asset managers, life insurers, pension schemes and others to disclose their climate-related risks in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) by 2025.

Ahead of these government-level initiatives, the Principles for Responsible Investment (PRI), a global network of investment institutions, plans to introduce mandatory outcomes-based reporting next year for its signatories to help them understand the impact of their investments on the SDGs.

Investors focus on the Sustainable Development Goals

Since their launch in 2015, the SDGs have been adopted by a wide range of financial institutions and many large corporates to analyse the environmental and social impact of their activities.

For example, a working group of banks, pension funds and other investment institutions set up by the Dutch central bank DNB, has produced a series of 'indicators' to help investors assess how their investments and loans contribute to the SDGs.

The aim, DNB said is "to substantially increase the proportion of finance that contribute to achieving the SDGs, from millions to billions".

Among other institutions giving strong backing to the SDGs is Pimco, one of the world's largest fixed income investors with more than $2 trillion under management. The firm recently launched a set of principles designed to encourage more corporate investment in support of the goals.

Among the aims of the CFO Principles for Integrated SDG Investments and Finance, published jointly with Italian energy giant Enel, are:

- To ensure that sustainable finance frameworks — including taxonomies, standards, and verification methodologies — promote a balance between (i) ensuring credibility

and comparability and (ii) encouraging private sector experimentation and innovation; and
- To help financial institutions and investors achieve real-world outcomes in line with the SDGs.

Many green bond issuers already refer to the SDGs in their framework documents and, in June, ICMA published a guide showing how they relate to the eligible projects defined by the GBP and the Social Bond Principles.

It is not surprising, therefore, that the SDGs feature prominently in the impact reports of most green bond funds.

Also unsurprising, given the regulatory backing for the TCFD and widespread governmental support for the Paris Agreement on climate change, is the focus on climate-related reporting.
(See page 13)

Impact reporting – the search for standardisation

A plethora of initiatives have been launched in recent years to help investors assess and report on how their activities contribute to the SDGs, and particularly the climate-related impact of their investments.

But the proliferation of standards and frameworks has made it increasingly difficult for investors to compare the behaviour and performance of companies using different approaches. Several projects have been launched in recent months to address this problem.

One example is an effort to harmonise the environmental, social and governance (ESG) criteria used in corporate reporting developed by the World Economic Forum (WEF) in collaboration with the 'big four' accountancy firms – Deloitte, EY, KPMG and PwC – and in consultation with corporates, investors, NGOs and other international organisations.

Mark Carney, UN Special Envoy for Climate Action and Finance, has welcomed the work, saying: "I encourage governments, regulators, the official accounting community and voluntary standard setters to work with the [WEF's] International Business Council towards creating a globally accepted system of sustainability reporting based on this project's ground-breaking work."

The project aims to accelerate convergence among the leading private standard-setters and bring "greater comparability and consistency to the reporting of ESG disclosures", according to the WEF.

It includes standards from the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), the Task Force on Climate-related Financial Disclosures, International Organization for Standardization (ISO), the Natural Capital Protocol, the Value Balancing Alliance, Science Based Targets Initiative and the World Business Council for Sustainable Development.

This could be helpful to managers of green bond funds as most of those examined in this survey pay close attention to the ESG performance of the bond issuers in their portfolios.

In a parallel initiative, a group of influential industry groups that are responsible for the standards and frameworks used in most sustainability reporting, have agreed to work together towards comprehensive corporate reporting.

The five organisations – CDP (formerly the Carbon Disclosure Project), the Climate Disclosure Standards Board (CDSB), the GRI, the International Integrated Reporting Council (IIRC) and SASB – say there is "a groundswell of demand to understand the connection between sustainability topics and financial risk and opportunity, along with the contribution of business to achieving the SDGs". Furthermore, they note "there is growing appetite from regulators, policymakers and the accounting profession to respond to this demand".

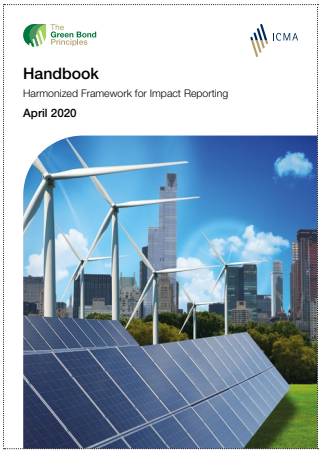
Mark Carney, UN Special Envoy for Climate Action and Finance: "I encourage governments, regulators, the official accounting community and voluntary standard setters to work … towards creating a globally accepted system of sustainability reporting"

In September 2020 they co-published a paper covering both financial accounting and sustainability disclosure, in which they pledged to cooperate to help develop "the comprehensive solution for corporate reporting that is urgently needed".

Since then, several other initiatives have been announced that all aim to enhance the quality and comparability of impact reporting. In November alone, the following were announced:
- The Global Impact Investing Network (GIIN) issued a consultation document – Methodology for Standardizing and Comparing Impact Performance – which aims to help investors: select investments with high impact potential more effectively; integrate impact and investment management to optimise results; and improve the reporting of impact.
- Sustainalytics, a research and ratings firm, which also provides second opinions on green bonds, launched a series of 40 'Impact Metrics' to help investors improve their measurement of both positive and negative ESG impacts of their portfolios. The metrics cover more than 12,000 companies and enable investors to choose specific impact themes and SDGs which align with their investment strategy.
- The Partnership for Carbon Accounting Financials (PCAF), an industry-led initiative comprising 69 banks, asset managers and pension funds, launched a carbon accounting standard to help financial institutions consistently measure and disclose the GHG emissions financed by their investments and loans. The Global GHG Accounting and Reporting Standard for the Financial Industry enables institutions to assess climate-related risks in line with the recommendations of the TCFD.
- IFC's GB-TAP is developing the Green Finance Review Protocol (GFRP). This voluntary protocol aims to provide a neutral mechanism to translate diverse information into comparable and aggregable information that can be used by market participants regardless of the particular nuances and approaches used in the green finance process. The GFRP components are designed to ensure dataflow efficiency in the green finance ecosystem and will support emerging market green bond issuers to deliver information to market participants in accordance with best practices. The GFRP will enable issuers to produce comparable green finance frameworks, consistent external reviews, and impact reports.

GFRP leverages on the existing body of knowledge and tools, including ICMA's Green Bond Principles and LMA's Green Loan Principles.

Towards consistent reporting on green bonds



Handbook – Harmonized Framework for Impact Reporting*

A key initiative to encourage more impact reporting in the green bond market is the *Handbook – Harmonized Framework for Impact Reporting*, published in 2019 by a group of development banks (see Glossary). Among its recommendations for green bond issuers, it says:

- The impact report should illustrate the expected environmental impact made possible as a result of projects to which green bond proceeds have been allocated. It should be based on *ex-ante* estimates (developed prior to project implementation) of expected annual results for a representative year once a project is completed and operating at normal capacity.
- It could also be beneficial to report the estimated lifetime results and/or project economic life to provide users with a basis for understanding the impact of the project over its life.
- If the issuer samples *ex-post* verification of specific projects, it is recommended that the relevant results are included in the reporting.
- To facilitate comparison of project results, it is suggested that issuers aim to report on at least a limited number of sector-specific core indicators for projects financed by their green bonds.
- For the calculation of indicators, where there is no single commonly-used standard, issuers may follow their own methodologies, but they are encouraged to provide full transparency on the applicable GHG accounting methodology and assumptions.
- Issuers may elect, for consistency reasons, to convert units reported for individual projects. This should be based on a standard conversion factor to facilitate comparison and aggregation, for example, converting tons of coal equivalent (TCE) to megawatt hours (MWh), with appropriate disclosure of the conversion approach. However, complex recalculations that are not publicly disclosed in project documentation, such as re-estimating GHG emissions based on consistent baseline assumptions, should be avoided.
- Issuers are encouraged to be transparent about projects with partial eligibility.

As most green bond funds base their impact reports on information provided by bond issuers, these guidelines are clearly relevant for fund managers.

But the Handbook also warns that "Investors should be aware that comparing projects, sectors, or whole portfolios is difficult because general assumptions on inputs in calculations, like grid factors and calculation methods, also vary significantly". In addition, the authors note that the cost structures between countries also vary so that developing cost efficiency calculations (e.g. results per $1 million invested in eligible projects) could place smaller countries with limited economies of scale at a disadvantage.

For renewable energy projects, the handbook proposes three 'core indicators':

- Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent;
- Annual renewable energy generation in MWh/GWh (electricity) and GJ/TJ (other energy); and
- Capacity of renewable energy plant(s) constructed or rehabilitated in MW.
- For energy efficiency projects, it suggests two 'core indicators':
- Annual energy savings in MWh/GWh (electricity) and GJ/TJ (other energy savings); and
- Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent.

It cautions, however, that "there exist a number of different methodologies for estimating and reporting GHG emissions". The differences mainly relate to the assumptions used for estimating the future output, the emission conversion factors, definitions for the boundaries of a specific project, scope of the GHG emission reductions attributable to the project, and the baseline alternative used for comparison with the project.

The authors note that efforts are underway to harmonise GHG accounting methodologies for particular industry sectors but that, in the absence of a single approach, institutions should strive to make their own methodologies publicly available and transparent.

**A related document outlining a harmonised impact reporting framework for social bonds was published in June 2020.*

› Survey methodology

Environmental Finance has been analysing and reporting on the green bond market since its inception in 2007.

As the market has grown and matured it has attracted an ever more diverse range of issuers and investors. The growing demand from mainstream institutions such as pension funds and insurance companies has, in turn, led to the launch of funds dedicated to this fast evolving market.

But, while issuers have been greatly helped in structuring their environmental impact reports for particular bonds, by the Green Bond Principles and other guidelines, green bond funds face a more complex task when it comes to aggregating the impact data from many different issuers.

To reveal the various approaches funds use in their impact reporting and to examine how well their reports meet the needs of investors, we decided to conduct a survey of the market.

An online questionnaire was sent to 55 funds which allocate, or intend to allocate, at least 50% of their assets to green bonds, in September 2020. A complementary questionnaire was sent to over 200 investors and 30 respondents were followed up with a telephone interview.

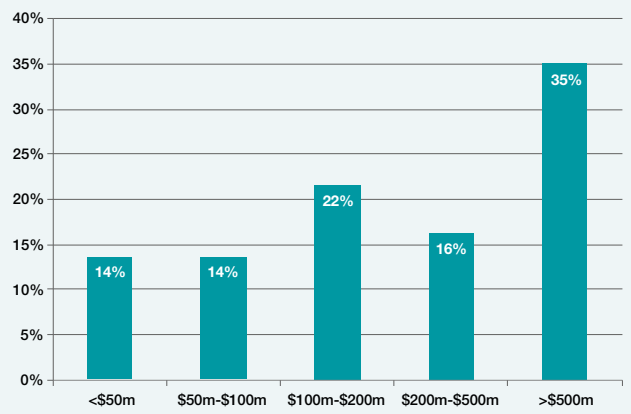
This report is based on the responses we received and our own research of publicly available information. We intend to repeat the exercise next year.

Green bond funds – what do they offer?

The green bond fund market is diverse and growing. Some funds have been buying green bonds for more than 10 years while many others are relatively new to the market. Our survey focussed on the 49 funds that claim to hold more than 50% of their assets in labelled green bonds and that have been operating for more than 12 months. (See pages 14-17) The survey was completed by 38 funds of the 49.

The funds vary significantly in size. More than a third manage assets of more than $500 million, while 14% have less than $50 million. (see Figure 1).

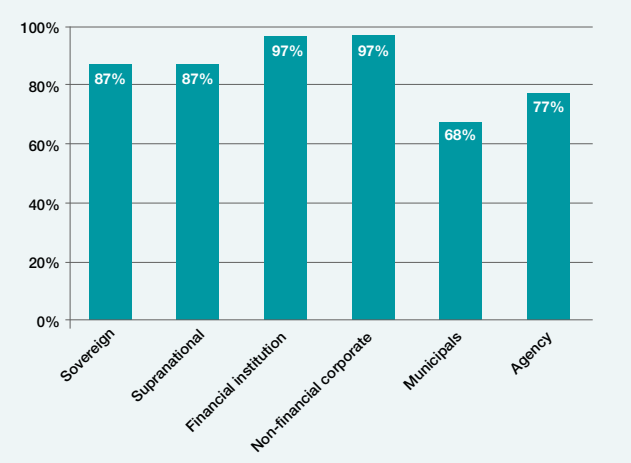
Figure 1: What is the size of your fund?



Most of the funds are based in Europe, with 20 of the 47 being listed in Luxembourg, but eight are listed in North America and one in Australia.

All but one of the funds surveyed invest in bonds from non-financial corporates and financial institutions, while 87% also hold sovereign issues and 68% hold bonds from municipal issuers.

Figure 2: Issuer type



As green bond issuance is most prevalent and mature in developed markets it's no surprise that only one fund has no bonds from European issuers and nine out of ten hold bonds from North America. Almost 80% of the funds hold emerging market (ex-China) bonds and more than two-thirds hold Chinese green bonds.

In terms of credit ratings, just over half (54%) of the funds surveyed restrict their purchases to bonds with ratings of B- or higher, but the rest impose no minimum credit quality. (see Figure 3)

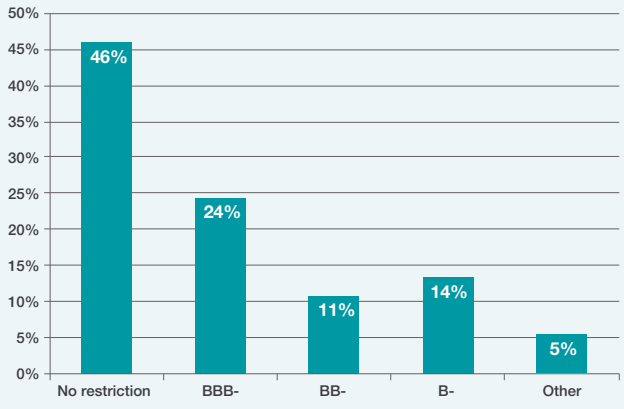
One of the biggest green bond funds to date – the Amundi Planet Emerging Green One (EGO) – which was set up to invest exclusively in bonds issued by financial institutions in emerging markets, uses a credit enhancement mechanism so that it can offer the investment grade of BBB+ to its investors, despite holding bonds with a lower credit rating.

Impact reporting

Most green bond funds require issuers to align with the Green Bond Principles (GBP) or similar internal frameworks which call for annual reporting of the bonds' environmental impact. (see page 5) It is therefore to be expected that green bond funds would also have some form of impact reporting as part of their responsibilities to transparency and keeping their investors informed.

According to our survey, three-quarters of funds already have some form of impact reporting, with a further 15% intending to issue fund impact reports in the future. (See Figure 4)

Figure 3: What is the minimum credit rating you require of the green bonds you buy?



However, just as the funds vary considerably in maturity and size, so their impact reports differ widely in terms of format, frequency and the level of detail they provide on impact metrics, methodologies and benchmarks. (See pages 14-17) They range in size from two pages to 51 pages. (See Table 1)

Some funds report their green impact metrics as part of a monthly up-date, alongside financial information and market

Table 1: Fund impact reports - format

Name	Frequency	Length	Financials data included	Case studies	Methodology
Euro Denominated Funds					
Amundi Responsible Investing Green Bonds I C	Monthly	6	No	No	Yes
Amundi Responsible Investing Impact Green Bonds I C	Monthly	6	No	No	Yes
AXAWF Global Green Bonds I Dis EUR	Monthly	3	No	No	No
BNP Paribas Green Bond I Cap (formerly Parvest)	Annual	6	No	No	Yes
ERSTE Responsible Bond Global Impact T	Annual	2	No	No	Yes
Eurizon Absolute Green Bonds Z Cap	Annual	20	No	Yes	Yes
JSS Sustainable Green Bond Global P EUR acc	Annual	15	Yes	No	Yes
	Monthly	5	Yes	No	Yes
Mirova Euro Green & Sustainable Bond I/A (EUR)	Monthly	5	Yes	No	Yes
	Annual	37	Yes	No	Yes
Mirova Euro Green & Sustainable Corporate Bond I/A (EUR)	Monthly	7	Yes	No	Yes
Mirova Global Green Bond I/A (EUR)	Monthly	6	Yes	No	Yes
NN (L) Green Bond I Cap EUR	Monthly	8	Yes	Yes	Yes
NN (L) Green Bond Short Duration I Cap EUR	Monthly	8	No	Yes	Yes
ODDO BHF Green Bond CR EUR^	Monthly	4	Yes	No	No
US Dollar Denominated Funds					
Amundi Planet - Emerging Green One - Senior USD	Annual	20	No	Yes	Yes
Calvert Green Bond I					
LO Funds Global Climate Bond USD NA	Annual	51	No	Yes	Yes
Mirova Global Green Bond N	Monthly	5	No	No	Yes
Syz AM (CH) Green Bonds - USD D (GAM Investment Managers)					
TIAA-CREF Core Impact Bond Fund (formerly Social Choice Bond Fund) (Nuveen)	Annual	4	No	No	Yes
TIAA-CREF Green Bond Institutional	Annual	4	No	No	Yes
Other Currencies					
Affirmative Global Bond Fund (Colonial First State)	Annual	20	No	Yes	Yes
AlphaFixe Green Bond Fund	Quarterly	3	Yes	No	No
Captor Dahlia Green Bond - Class C	Annual	29	No	Yes	No
SPP Grön Obligationsfond A	Quarterly	3	No	No	Yes
iShares Global Green Bond ETF	Annual	3	No	Yes	Yes
iShares Green Bond Index (IE) D Acc EUR	Annual	3	No	Yes	Yes
Lyxor Green Bond (DR) ETF C EUR	Annual	16	No	Yes	Yes

***Table based on publicly available impact reports. Only fund specific impact reports are considered, not company wide sustainability or ESG reports*

commentary. Others publish annual standalone impact reports and some integrate their impact data into annual company-wide sustainability, ESG or CSR reports. (See Table: Fund impact reports – at a glance, pages 14-17)

Each of these approaches has its merits, but the lack of consistency can make it time consuming and laborious for investors to access the information they need and to compare funds against each other.

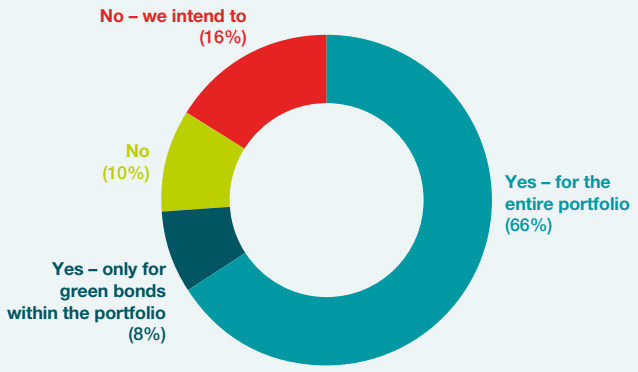
Whether they issue an impact report or not, four out of five funds track the ESG rating of issuers and many exclude bonds from issuers whose rating is too low or if they are engaged in certain industries such as fossil fuels.

Many funds have stringent internal criteria for determining which issuers and bonds are eligible for their portfolios. In some cases, these criteria lead the funds to invest in bonds which are not labelled 'green' but are still considered green by the fund managers.

However, investment in unlabelled bonds can be contentious and can have ramifications for fund level impact reporting as unlabelled bonds rarely follow the Green Bond Principles and therefore do not have impact reporting obligations.

Christopher Wigley, an independent ESG and fixed income portfolio manager, clarifies: "In the case of bonds from green companies, I and many investors, do not consider these bonds as Green Bonds. This is because they are not aligned with the

Figure 4: Do you issue an impact report?



Green Bond Principles. Further, the cornerstone of the Green Bond Principles is disclosure of the use of proceeds i.e. for green purposes. A green company may issue a bond but then not use the proceeds for green purposes…Additionally, conventional bonds issued by green companies do not undertake to report regularly so it is difficult for investors to assess the impact of those bonds".

While exclusion criteria and issuers' ESG ratings provide some reassurance to fund investors that the fund is fulfilling its green goals, most fund managers think it is important to quantify the environmental impact it is making.

Data collection

The first challenge in producing an impact report for a green bond fund is the collection of the raw impact data from the publicly available reports produced by bond issuers and/or third parties. This is currently a time consuming, mostly manual task which does not always result in sufficient data being gathered.

Some green bond funds hold more than 100 bonds and there is little consistency in the timing, format, metrics, methodologies, and benchmarks used by issuers in their impact reports.

Even the most extensive fund impact report cannot capture data on 100% of its green bond holdings. The sporadic timing of issuers' impact reports and the proportion of newly issued and not yet reporting bonds means that sometimes data is simply not available when the fund is compiling its report.

The different formats in which issuers produce their impact reports can add additional layers of difficulty in collecting the data required. Most are published in the form of a PDF or other non-interactive format. Furthermore, as there is little consistency in the structure of the reports, they require close reading to find the salient impact information and to locate the sometimes non-existent methodologies section which is necessary to understand how the impact numbers have been calculated.

Issuers' track records – or lack of them – can also affect the reliability of their impact reports. For example, if an issuer has launched numerous bonds in the same industry sector and reported on them against certain metrics over several years, then their projected impact numbers for projects under construction are likely to be more accurate. Some green bond fund managers interviewed said they take a more rigorous look at any projected numbers from new issuers to make sure they are correct. They also

› Case Study – Data collection

Katie House explains how Affirmative Investment Management manages to collect impact data for more than 90% of the bonds in its funds.

Affirmative Investment Management (AIM) is a dedicated fixed income impact investor. We manage fixed income portfolios that generate positive environmental and social impact and an essential part of that is annually reporting the impact behind our portfolios. Our first impact report covered 2016 holdings and every year since then we have published one impact report per portfolio.

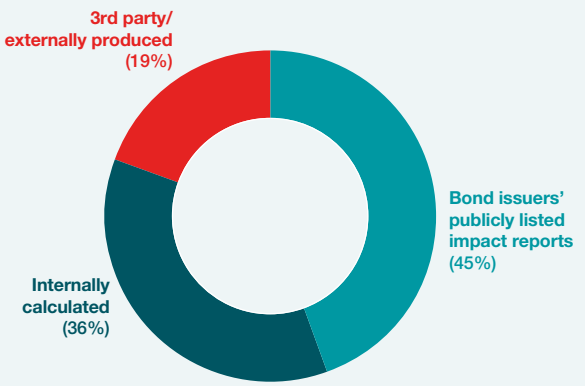
During impact reporting we strive to gather information for all our holdings and are proud that overall we collected impact data for 92% of our 2019 holdings, with our flagship fund the Lombard Odier Global Climate Bond Fund achieving 93% coverage. Our approach to impact data collection is multifaceted and we credit it with achieving such high coverage rates.

Our approach to data collection involves multiple steps:

- *Build a relationship with issuers* – we engage regularly with issuers and often on a one-to-one basis. This means when it comes to our impact reporting cycle there is already an established relationship between AIM and the issuer.
- *Start with the published materials* – our first step during data collection is to look at what the issuer has already published by way of an annual impact report. Most of our holdings are labelled bonds and with issuing a labelled bond generally comes a commitment to publish an impact report.
- *Engage held issuers* – during the production of the 2019 impact report we engaged with 80% of held issuers. We engage when the issuer has not yet published its annual impact report to ask for interim data and find this is often successful. We also engage to enhance the detail on the reporting that the issuer has already published.
- *Feedback to intermediaries and issuers* – we regularly provide feedback to issuers and intermediaries about what information is included in the best impact reports. Year-on-year we believe that this improves the coverage we can achieve and the detail of the data that we get.

Katie House is an analyst, verification and impact, at Affirmative Investment Management

Figure 5: How is the data for your fund's impact report gathered?



regularly check previous projections with the actual numbers when they become available to help refine projection modelling for future projects.

Several of the funds surveyed, especially those managed by smaller firms, said the time and resources required to gather impact data from issuers is a major barrier to extending the scope of their fund impact report.

Sanna Petersson, sustainability manager at Captor Fund Management, explains: "it's not just the difference in impact data that makes it difficult to show aggregated data on a portfolio level, but also the fact that unlike annual reports, the impact reports from our holdings are spread over a whole year."

These challenges have led to a growing market of third-party data service companies who can gather and potentially homogenise issuers' impact data on behalf of green bond funds. This solution has its own costs and drawbacks but could lead to greater standardisation if a limited number of data companies use the same models and methodologies to homogenise issuer impact data. According to our survey, 19% of funds currently outsource some or all of their data gathering and aggregation to third party companies. (See Figure 5)

It is common practice (nine out of ten funds) to have either formal or informal engagement protocols and lines of communication with issuers to check impact numbers or request further metrics. Several fund managers also said that most green bond issuers are eager to facilitate fund level impact reporting and provide contextual or additional data on request

Erika Wranegård, who manages the green bond fund of Sweden's Ohman Group, confirmed: "many first-time green bond issuers have just begun their 'sustainability journey'. They are often eager to engage with investors and soak up every piece of information about investor preferences for sustainable business practices."

She added that she had been surprised "by the speed with which first-time green bond issuers integrate sustainability practices into their operations."

In some cases, communication between issuers and potential investors before a bond is launched can help clarify expectations in terms of impact reporting practices and metrics.

It is usually necessary for funds to be pragmatic and concentrate on the impact information which is readily available and focus on a representative share of their portfolio rather than aim for exhaustive coverage. But it is therefore important, for the sake of transparency, for fund impact reports to clearly state the proportion of the portfolio covered.

Data aggregation

The main challenge in fund level reporting is the aggregation of impact data collected from disparate issuers using an array of metrics, methodologies and baselines. One aspect of this is the translation of the different metrics reported by issuers into a single metric in the fund impact report.

An added complication is the variety of ways used to report on the same metric – for example, GHG emissions avoided or energy savings – as the choice of baseline can have a big influence on the results. Some funds recalculate GHG emission reductions or energy savings calculations reported by different issuers using a homogenising baseline.

As one leading investor in green bond funds explains: "impact measurement is quite complex. … For example, providing 'avoided carbon emissions' as a reporting metric can be challenging to interpret. To calculate this, one needs to compare the amount of carbon emissions generated by the activity that is financed by the green bond with the amount of carbon emissions that would have been generated in an alternative scenario e.g. a sector benchmark, a conventional production method, a situation where the activity did not take place.

"Since there are currently no prescriptions on what the scenario should be, the resulting numbers can vary widely between green bond impact reports. In turn, if an asset owner or investor wants to report on this metric, it is not a simple sum of the avoided emissions found in the impact reports of the different green bonds they invest in."

The challenges and complexities in data gathering and aggregation have led some fund managers, for example Captor Fund Management, to report on each bond separately and simply list the impact data from the issuers' impact reports rather than trying to aggregate them to give an overall fund impact.

Figure 6: What environmental metrics does your impact report cover?

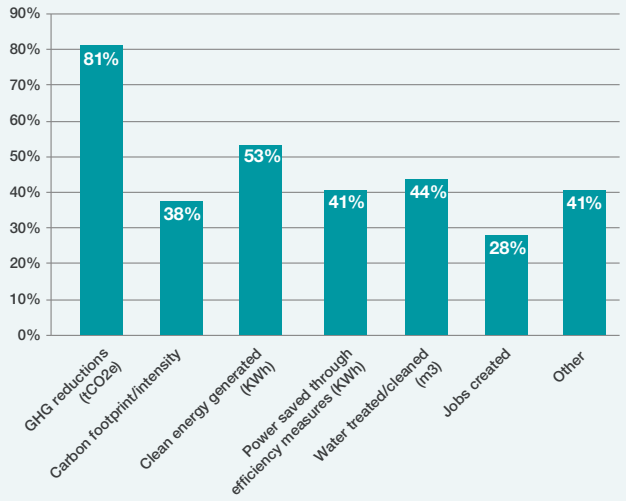
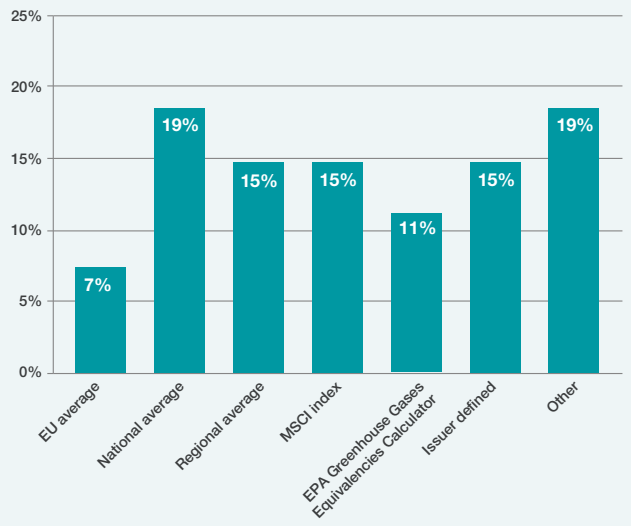


Figure 7: What baseline/benchmark do you use to calculate GHG emissions avoided?



Some funds with the resources available have developed their own innovative solutions to data gathering and aggregation, usually in the form of internal databases. For example's BlackRock's 'Aladdin Climate' portfolio management software has integrated impact metrics into the firm's risk assessments and database and LGT Capital Markets use its internal 'ESG Cockpit' to assess issuer ESG credentials and potential SDG alignment.

Metrics

As climate change mitigation is one of the key targets of green investment and one of the main environmental objectives of the Green Bond Principles, it is no surprise that the reduction or avoidance of GHG emissions is the most widely reported metric by green bond funds. (See Figure 6)

But, as discussed above, there are numerous ways of calculating GHG emission reductions and the choice can greatly affect the resulting data and reported impact.

There are a variety of benchmarks that can be used which can be as granular as the geographical grid reference of the project or as macro as the host country average or even an EU average which can result in very different impact data for the same project. (See Figure 7)

For example, if a fund wants to compare two renewable energy projects in Poland on the basis of GHG emissions avoided, but one has used the national GHG emissions baseline while the other has used the EU average baseline, then one of the projects needs to be converted to the other baseline to make the two projects comparable.

The decision of whether to use regional, national or continental averages affects the recorded impact in terms of avoided emissions. If national averages are used, then identical projects in different countries will have different impact statistics and this could result in greater impact being reported for projects in countries which currently have higher GHG emission levels.

When gathering issuers' impact data, even when the metrics reported are comparable, a fund must consider the benchmarks used and potentially re-do calculations using a homogenising benchmark.

Data presentation

The decisions and models used at a fund level to determine which metrics to aggregate and include in an impact report can affect the perceived impact of the fund.

"The choice of a reporting metric can have numerous effects," said Colette Grosscurt, responsible investment officer at Dutch asset manager and green bond investor, Actiam.

"In some cases it can mislead readers to believe certain impacts are larger than what is actually achieved, (it can) create confusion as some impacts are reported only for a selection of the projects to which the green bond is allocated, or it can lead readers to compare the impacts of different green bonds which have different underlying assumptions that actually make them incomparable."

Some funds replace or augment the data on GHG emissions avoided by reporting on the carbon intensity of their holdings. This potentially facilitates more universal comparisons, although it has its own aggregation and calculation challenges.

One potential complication with carbon intensity or carbon footprint data is when applying it to green bonds from municipalities and sovereign issuers rather than corporates. The carbon intensity calculation requires using a figure for the issuer's revenues and carbon footprint requires the issuer's enterprise value, which is relatively straightforward for corporates but GDP or tax revenues are not necessarily the equivalent for municipalities or sovereign issuers. (See case study LO Funds – Global Climate Bond fund)

Another possible pitfall to consider when aggregating issuer impact reports is ensuring that issuers have apportioned their impact in proportion to their investment in a particular project and have not claimed 100% of the project's environmental impact while providing less than 100% of the funding.

This requires issuer transparency on how they have calculated their impact numbers and, if they have not been appropriately scaled, then the fund may need to do this before integrating the issuer numbers into its report.

Similarly, calculating what share of a particular bond's total impact a green bond fund can claim is important for fund level reporting as it is unlikely that the fund will hold the entire bond.

An element of country and/or industry experience is also advantageous when judging data on the claimed output and impact of projects as it can help fund managers to spot 'outliers' or inaccurate data. The lack of standardised issuer reporting and sometimes the inexperience of the issuer can lead to them overstating their bond's impact, for example as a result of using 'boiler plate' projections rather than real world numbers.

Spotting outliers in issuers' impact data and following up with them to get more accurate numbers is a key role in fund level impact report aggregation and is important in improving the transparency and accuracy of issuers' green bond impact reports.

All of these challenges and complexities that must be overcome when aggregating disparate issuer impact reports to create a fund level impact report can lead to two identical hypothetical funds delivering different impact numbers. This means that funds with more rigorous and exacting internal calculation processes could report lower impact numbers than funds which are less critical of the data they receive from bond issuers.

Erika Wranegård, fund manager at Ohman, sums up the challenges of fund level aggregation: "It is a manual and time-consuming process and leaves room for errors in the aggregation of issuers' green bond impact reports. That is because impacts reports are calculated with different baselines, report on avoided/reduced emissions and attribute different percentage of project impact to the green bond financing. This and other factors currently make aggregation of impact reporting on the portfolio level next to impossible. Looking ahead, it is clear the green bond market needs a better solution for aggregating impact reports on the portfolio level."

TCFD and the SDGs

Another way of presenting a fund's contribution to climate change mitigation is to estimate the portfolio's impact on global warming, as proposed in the scenario analysis recommendations of the TCFD.

Several funds, including those managed by AXA, BNP Paribas, Mirova and Affirmative Investment Management/Lombard Odier, already report on the extent to which they align with the 2°C target of the Paris Agreement. This metric lacks granularity, but allows investors to compare the impact of different funds more clearly and homogenises the impact of diverse green projects.

A more qualitative impact measure – alignment with the SDGs – is referred to by 25 of the 31 funds who issue impact reports. This can help clarify whether the fund is helping its investors towards their sustainability goals, but the lack of clarity on what exactly constitutes a contribution to each SDG leaves room for a broad spectrum of interpretation.

Some impact reports sketch only tenuous links between the bonds in their portfolio and the SDGs while others are much more stringent with the criteria they use to justify their claims. Guidance has been produced by the Dutch central bank to help investors understand how best to use the SDGs and ICMA has published a helpful High-Level Mapping to the Sustainable Development Goals specifically for issuers, investors and other bond market participants. If widely adhered to, these should lead to greater standardisation in future.

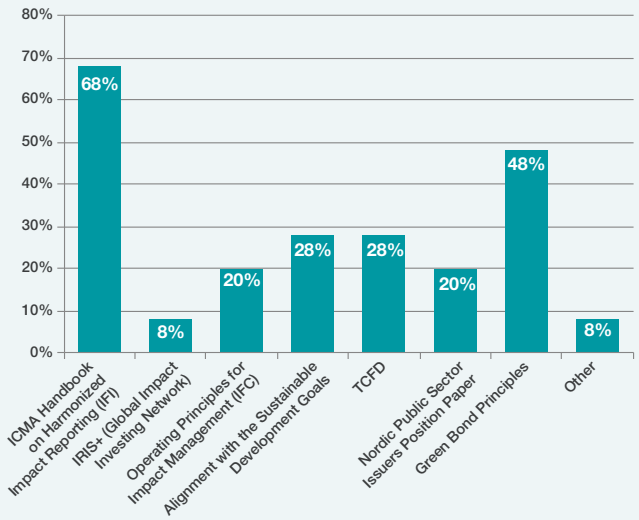
Another popular way to convey qualitative information about the impact of projects funded by green bonds is in case studies which augment the quantitative impact data with a photogenic narrative and texture. Although the case studies selected are not necessarily representative of the whole fund, they help add a more tangible impact angle and can help illustrate the fund's achievements to potential and current investors.

In search of standardisation

The choice of which metrics to use to assess the environmental impact of a project, bond, or fund is critical, as different metrics can tell different stories. Many investors who responded to our survey pleaded for greater standardisation in reporting as the market matures. (See page 5)

Greater standardisation in impact reporting by bond issuers would, in turn, improve fund level reporting but several respondents also noted that funds have an important role to play in improving issuers' reporting practices. Investors would find it easier to compare funds if there was more consistency in the way they gather and aggregate data from issuers.

Figure 8: Which impact reporting guidelines, if any, do you use?



Progress is already being made. An important decision for green bond funds is whether to report on impact per $/€ million invested or per bond and the vast majority of funds (90%) have opted for the first option.

This commonality aids the comparison of impact across funds and allows investors to calculate their own individual impact. Some funds take this a step further and supply each investor with an impact figure based on its share of the whole fund.

The Green Bond Principles stipulate some form of impact reporting is required, but the variety and nuances of the different projects funded by green bond finance makes it difficult to prescribe specific metrics and methodologies.

The ICMA *Harmonized Framework for Impact Reporting* (see page 7) is a significant step towards simplifying and standardising impact reporting and provides practical templates and instructions for issuers to help them produce comparable reports. Several other frameworks and guidelines on impact reporting are available to issuers and funds but the ICMA handbook is currently the most popular, being used by 68% of the funds in our survey. (See Figure 8)

But guidelines in themselves will not bring standardisation and regulators and industry associations can only prompt issuers so far. Green bond funds and other green bond investors can play a key role in both educating and motivating issuers to standardise their impact reports.

Their influence should be particularly strong on newer issuers and in emerging markets, where funds and other investors can stipulate which metrics and reporting standards they are most interested in receiving and even specify certain impact reporting practices as a condition for investing. Such requests can even be made to issuers and/or lead managers before a bond comes to market.

While there are multiple frameworks and guidelines outlining templates and reporting recommendations for issuers, however, there is very little guidance on fund level reporting or resources to help the aggregation process.

Green bond funds – at a glance

Name	Inception date	AuM on 30/11/20 USD (Million)	Report title/ additional impact documents	SDGs Referenced	TCFD Referenced	3rd party/ external input	Metrics
Euro Denominated Funds							
Ålandsbanken Green Bond ESG C	22/05/2019	82.83	Not available				
Allianz Green Bond W EUR	17/11/2015	873.28	Not available				
Amundi Responsible Investing Green Bds I C	21/12/2015	221.00	Fact Sheet	No	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per €1m)
Amundi Responsible Investing Impact Green Bonds I C	27/09/2016	806.01	Fact Sheet	No	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per €1m)
AXAWF Global Green Bonds I Dis EUR	05/11/2015	701.41	Responsible Investment - ESG Impact	No	No	No	Sovereign issuerS: CO_2 emissions (tCO_2/ per capita), Corporate issuers: carbon footprint (tCO_2/$m revenue), Water intensity (m3/$m revenue)
BfS Nachhaltigkeits fonds Green Bonds (Universal Investments)	19/10/2001	24.03	Not available				
BNP Paribas Green Bond I Cap (formerly Parvest)	07/09/2017	1,155.84	Extra Financial Report	No	No	Carbon4 Finance*	GHG emissions induced (tCO_2 per €1m), GHG emissions reduced/avoided (tCO_2 per €1m), total GHG emissions induced (tCO_2), total GHG emissions avoided/ reduced (tCO_2)
CM-CIC Green Bonds IC	08/06/2017	42.31	Not available				
CROWD - Green Bond Impact Fund A	30/12/2015	2.50	Not available				
DPAM L Bonds Climate Trends Sustainable J	28/06/2019	182.81	Not available				
ERSTE Responsible Bond Global Impact T	01/06/2015	191.16	Impact Information Sheet	Yes	No	ESG plus GMBH	GHG emissions reduced/avoided (tCO_2 per €1m)
Eurizon Absolute Green Bonds Z Cap	10/01/2018	2,277.57	Global Impact report	Yes	No	MainStreet Partners	Renewable/clean energy capacity financed (MW), Renewable/clean energy produced (MWh), Sustainable infrastructure (MWh), GHG emissions reduced/avoided (tCO_2 portfolio total), Water saved/purified (litres), Waste recycled (tonnes), Jobs created
Franklin Liberty Euro Green Bond ETF	29/04/2019	80.46	First impact report due in 2021				
HGA Obligations Vertes ISR I	27/10/2015	547.18	Not available				
JSS Sustainable Green Bond Global P EUR acc	30/11/2007	31.34	ESG Analytics	Yes	No	No	Carbon footprint (tCO_2 per €1m), Carbon intensity (tCO_2 per €1m), Stranded asset risk
			Fact Sheet	Yes	No	No	Corporate issuers: carbon footprint (tCO_2 per €1m), Socerign issuers: GHG intensity (tCO_2 equivalent per GDP)
LGT Sustainable Bond Fund Global (EUR) I1	30/11/2009	134.13	Not available				
MFM Global Sustainable Bonds	31/07/2019	30.20	Not available				

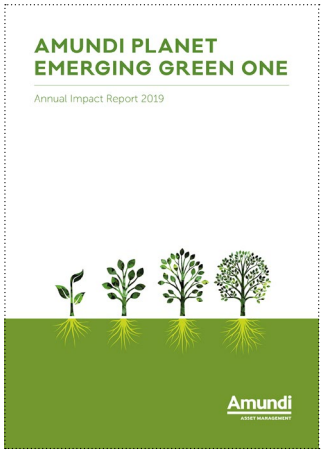
Name	Inception date	AuM on 30/11/20 USD (Million)	Report title/ additional impact documents	SDGs Referenced	TCFD Referenced	3rd party/ external input	Metrics
Mirova Euro Green & Sustainable Bond I/A (EUR)	15/10/2013	704.33	Fact Sheet	Yes	No	Carbone4	GHG emission induced (tCO_2 per €m company value), GHG emission reduced/ avoided (tCO_2 per €m company value)
Mirova Euro Green & Sustainable Corporate Bond I/A (EUR)	11/05/2011	415.70	Fact Sheet	Yes	No	Carbone4	GHG emission induced (tCO_2 per €m company value), GHG emission reduced/ avoided (tCO_2 per €m company value)
			Mirova Impact Report - Acting as a responsible investor	Yes	No	Carbone4	GHG emission induced (tCO_2 per €m company value), GHG emission reduced/ avoided (tCO_2 per €m company value)
Mirova Global Green Bond I/A (EUR)	02/06/2017	568.36	Fact Sheet	Yes	No	Carbone4	GHG emission induced (tCO_2 per €m company value), GHG emission reduced/ avoided (tCO_2 per €m company value)
NN (L) Green Bond I Cap EUR	01/03/2016	1,466.02	Strategy Brief and Impact Report	Yes	No	No	CO_2 footprint and intensity (tCO_2 per €1m), GHG emissions reduced/avoided (tCO_2 per €1m), waste generation (tonnes per €1m), Renewable/clean energy capacity added (MW)
NN (L) Green Bond Short Duration I Cap EUR	01/04/2019	98.34	Strategy Brief and Impact Report	Yes	No	No	CO_2 footprint and intensity (tCO_2 per €1m), GHG emissions reduced/avoided (tCO_2 per €1m), waste generation (tonnes per €1m), Renewable/clean energy capacity added (MW)
ODDO BHF Green Bond CR EUR^	01/10/19 (as a green fund)	146.39	Fact sheet	Yes	No	No	GHG emissions reduced/avoided (tCO_2 per €1m), Renewable/clean energy capacity added (MW)
Raiffeisen-GreenBonds I T	15/09/2015	196.11	Sustainability Report	Yes	No	Yes	CO_2 intensity, GHG emissions reduced/ avoided (tCO_2 per $1m)
			Carbon Footprint	No	No	Yes	
Rivertree Bond Euro Green Bonds R Cap	01/02/2016	60.60	Not available				
SEB Green Bond D EUR	05/12/1989	60.79	SEB Green Bond Impact Report	Yes	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per bond), Renewable/clean energy installed (MW), Energy produced (GWh), Energy savings (GWh)
UniInstitutional Green Bonds	28/04/2017	228.22	Not available				
DWS Invest Green Bonds Deutsche Asset Management	15/10/2018	149.42	Not available				
US Dollar Denominated Funds							
AllianzGI Green Bond Institutional	19/11/2018	35.59	Liquidating 17/12/2020				
Amundi Planet - Emerging Green One - Senior USD	28/02/2018	1,497.08	Annual Impact Report	Yes	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per $1m)
Calvert Green Bond I	31/10/2013	696.40	Not available				
LO Funds Global Climate Bond USD NA	01/03/2017	642.34	Impact Report	Yes	Yes	Carbon Yield and ISS ESG, South Pole Group	GHG emissions reduced/avoided (tGHG per year), Renewable/clean energy capacity installed (MW), Renewable/ clean energy generated (MWh), Daily passenger capacity for low-carbon transport, Water treated daily (m3), Green buildings by floor area (m2), Students with access to green education facilities, Children immunised, Jobs retained/created, Microfinance and SME loans

Name	Inception date	AuM on 30/11/20 USD (Million)	Report title/ additional impact documents	SDGs Referenced	TCFD Referenced	3rd party/ external input	Metrics
Mirova Global Green Bond N	28/02/2017	38.25	Fact Sheet	Yes	No	Carbone4	GHG emission induced (tCO_2 per €m company value), GHG emission reduced/ avoided (tCO_2 per €m company value)
Nikko AM Global Green Bond A USD	25/02/2010	55.77	Not available				
Ping An of China Asset Management China Green Bond Fund	11/11/2019	50.00	Not available				
Syz AM (CH) Green Bonds - USD D (GAM Investment Managers)	30/09/2003	37.14	Not available				
TIAA-CREF Core Impact Bond Fund (formerly Social Choice Bond Fund) (Nuveen)	21/09/2012	6,120.00 **	Measuring impact in public fixed income	Yes	No	No	GHG emissions reduced/avoided ($mtCO_2$), Affordable mortgages guaranteed or provided affordable housing, Renewable/clean energy capacity (MW), Renewable/clean energy generation (MWh), People benefited from clean water and wastewater projects, Full-time jobs created, Farmers and fishers trained, People reached through community programs, Air pollutants reduced (Mt), Energy saved (MWh), LEED certified buildings, Land conserved (million acres), Land restored or sustainably managed (million acres), Waste diverted from landfills (tonnes), wastewater treated (gallons/day), water saved (gallons)
TIAA-CREF Green Bond Institutional	16/11/2018	45.00	Measuring the impact of green bonds	Yes	No	No	GHG emissions reduced/avoided ($mtCO_2$), Affordable mortgages guaranteed or provided affordable housing, Renewable/clean energy capacity (MW), Renewable/clean energy generation (MWh), People benefited from clean water and wastewater projects, Full-time jobs created, Farmers and fishers trained, People reached through community programs, Air pollutants reduced (Mt), Energy saved (MWh), LEED certified buildings, Land conserved (million acres), Land restored or sustainably managed (million acres), Waste diverted from landfills (tonnes), wastewater treated (gallons/day), water saved (gallons)
The Colchester Global Green Bond Fund	30/05/2019	2.17	Not available				
Other Currencies							
Affirmative Global Bond Fund (Colonial First State)	06/04/2018	82.86	Impact Report	Yes	Yes	Carbon Yield and ISS ESG, South Pole Group	GHG emissions reduced/avoided (tGHG per year), Renewable/clean energy capacity installed (MW), Renewable/ clean energy generated (MWh), Daily passenger capacity for low carbon transport, Water treated daily (m3), Green buildings by floor area (m2), Students with access to green education facilities, Children immunised, Jobs retained/ created, Microfinance and SME loans
AlphaFixe Green Bond Fund	21/11/2017	185.16	Green Bond Fund Portfolio Description	Yes	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per $1m), Energy saving (kWh per $1m), Water savings (litres per $1m), Waste reduction (kg per $1m), carbon intensity ($tCO_2$ equivalent per $1m)

Name	Inception date	AuM on 30/11/20 USD (Million)	Report title/ additional impact documents	SDGs Referenced	TCFD Referenced	3rd party/ external input	Metrics
Captor Dahlia Green Bond - Class C	02/07/2018	90.00	Green Bond Report	Yes	No	Sustainalytics, Cicero, DNV-GL, ISS Oekom	Only issuer impact data listed - some bonds have impact metrics for renewable energy capacity and emissions avoided
Öhman Grön Obligationsfond A	12/10/2017	75.89	Not available				
SPP Grön Obligationsfond A	02/03/2015	786.86	Carbon Footprinting of Investments	No	Yes	Trucost	Carbon footprint (tCO_2 equivalent per NOKm sales revenue)
Passive Funds							
CSIF (Lux) Bond Green Bond Global Blue FB USD	15/04/2019	107.95	First impact report due in 2021				Intended metrics: to describe the qualitative and where possible, quantitative, indicators of the projects' environmental impact
iShares Global Green Bond ETF	13/11/2018	145.02	Environmental Impact	Yes	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per $1m), Renewable/clean energy generated (MWh per $1m), Energy savings (MWh per $1m), Land area reforested (hectares per $1m), Water saved (m3 per $1m), Waste collected (m3 per $1m), People benefitting from projects (per $1m), New passengers on public transport per year (per $1m)
iShares Green Bond Index (IE) D Acc EUR	16/03/2017	2,898.02	Environmental Impact	Yes	No	No	GHG emissions reduced/avoided (tCO_2 equivalent per $1m), Renewable/clean energy generated (MWh per $1m), Energy savings (MWh per $1m), Land area reforested (hectares per $1m), Water saved (m3 per $1m), Waste collected (m3 per $1m), People benefitting from projects (per $1m), New passengers on public transport per year (per $1m)
Lyxor Green Bond (DR) ETF C EUR	21/02/2017	604.60	Impact Report	Yes	No	No	Portfolio GHG emissions reduced/ avoided (tCO_2 equivalent), Newly installed renewable/clean energy generation capacities (MW), Renewable/clean energy produced (MWh), Water treated (m3), Green building floor space (m2)
			ESG and climate metrics	Yes	No	No	Portfolio carbon footprint, GHG emissions reduced/avoided (tCO_2 equivalent per $1m), Carbon intensity ($tCO_2$ equivalent/$1m sales, Weighted Average Carbon intensity tons (CO_2equivalent/$m sales), Exposure to transition risk
VanEck Vectors Green Bond ETF	03/03/2017	50.02	Not available				Renewable/clean energy produced (MWh per $1m), Energy saved (MWh per $1m), GHG emission reduced/avoided (tCO_2 equivalent per $1m), Land reforested (hectares per $1m)

** Carbon4 Finance is a spin-off company of French advisory firm Carbone 4*
*** >30% AuM in green bonds*

Case Study
Amundi Planet EGO Fund



The Amundi Planet Emerging Green One (EGO) fund was launched in 2018 in partnership with IFC as part of its Green Cornerstone Bond Program (GCBP). The fund is supported by IFC's GB-TAP (Green Bond Technical Assistance Program) which aims to create a market for green bonds in developing countries.

AP EGO is a layered fund with a credit enhancement mechanism. Three features highlight the fund as a landmark for green finance. It is one of the largest green bond funds, with up to $2 billion to deploy, and it is the first fund solely focussed on green bonds from emerging market financial institutions. Its partnership with GB-TAP is the first programme to combine demand and supply mechanisms for green bonds.

The EGO fund received six global awards in 2019, including *Environmental Finance*'s Initiative of the Year (2019) and Green Bond Fund of the Year.

Frequency: Annual

Pages: 19

Weighted portfolio coverage: 63.8% (23/36 green bonds) – The 68.2% of the fund which is not currently invested in green bonds is not included in the report[1]

Metrics: Avoided emissions per €1m invested per year based on the fund's green bond investments - 1,353.7 $tCO_2e/M€$

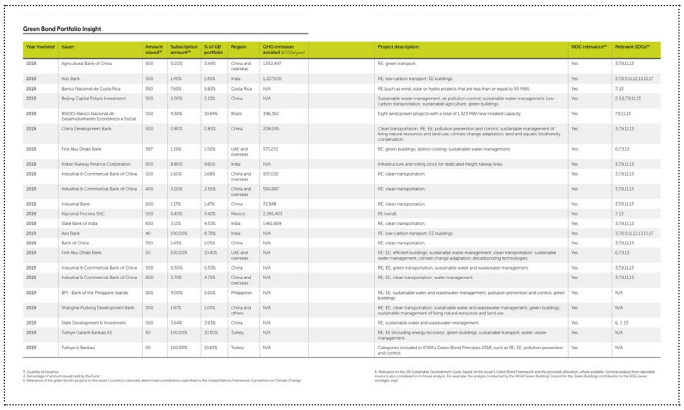
Additional metrics: ESG ratings of issuers

UN SDG aligned – 11/17

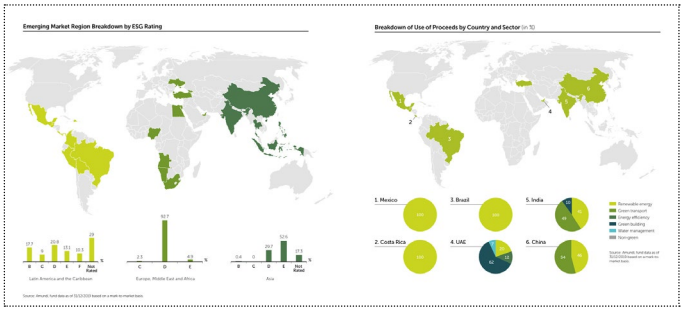
Other alignments – Relevance of the projects to the host country's 'Nationally Determined Contributions' submitted to the UN Framework Convention on Climate Change

1. The EGO fund invests only in emerging markets and it is working to increase the issuance of green bonds from these countries. The share of its assets currently invested in green bonds is currently lower than most funds in this study but the EGO fund is targeting 100% green bonds by 2025.

Portfolio composition – By sector, country of issuance and by country of 'use of proceeds'. Also detailed bond by bond information subscription amount.

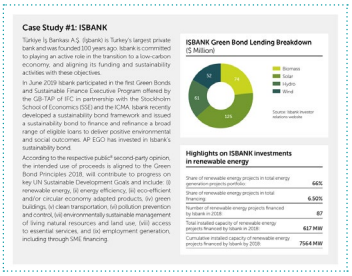


Geographical distribution – map of emerging markets covered by fund investments



Methodology – 1 page on the calculation of GHG emissions avoided.

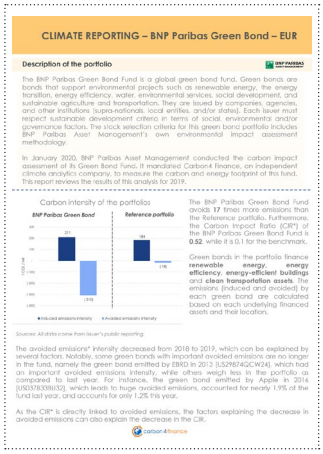
Case studies – 2



Also included: Input and quotes from Alecta - a leading investor in the fund, timeline of the fund's inception and progress, information on GB TAP and supporting green bond issuance in emerging markets

Not included – Detailed financial performance of the fund (readily available in monthly and annual reports), metrics other than GHG emissions avoided

Case Study
BNP Paribas Green Bond fund



The BNP Paribas Green Bond fund was formed in 2017 when the green bond market was sufficiently large and diversified "to offer investors a real investment solution". The fund aims to "provide the ability to invest in a range of corporate, sovereign and agency issued instruments whilst maintaining daily liquidity".

In January 2020, BNP Paribas Asset Management conducted a carbon impact assessment of the fund and mandated Carbon4 Finance, an independent climate analytics company, to measure its carbon and energy footprint. The impact report reviews the results of this external analysis for 2019.

The report is unusual in that it was produced by Carbon4 Finance on behalf of the fund manager.

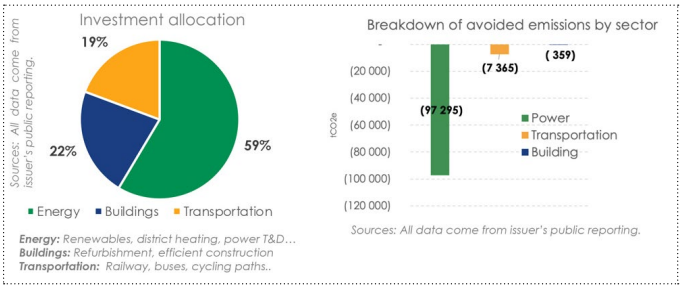
Frequency: Annual

Pages: 6

Weighted portfolio coverage:

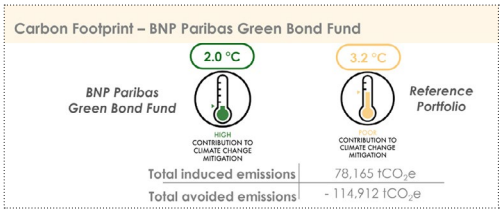
Metrics:

- Emission induced per € million invested – 211 tonnes CO_2
- Emission avoided per € million invested – 310 tonnes CO_2
- Total induced emissions – 78,165 tonnes CO_2 e
- Total avoided emissions - 114,912 tonnes CO_2 e



Additional metrics:

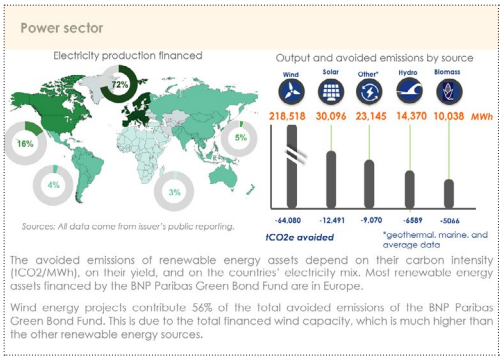
- Carbon impact ratio (emissions intensity): relative to a reference portfolio
- Alignment with the 2°C global warming target of the Paris Agreement



UN SDG alignment: Not mentioned

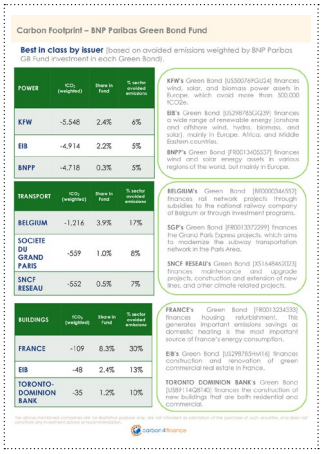
Portfolio composition: Breakdown of fund holdings by sector and avoided emissions by sector, specific avoided emissions by power source, building type and mode of transport

Geographical distribution: Only for power sector (59% of fund by investment allocation)



Methodology – 1/3 page explanation – further methodology information on Carbon4 Finance website

Case studies – 9 best in class issuers across the 3 main sectors (energy, buildings and transport)



Also included: Green bond definition, comparison to previous year's impact report and explanation of changes

Not included: Detailed financial performance of the fund (readily available in monthly and annual reports)

Case Study
LO Funds – Global Climate Bond fund

LO Funds – Global Climate Bond was launched in March 2017, as a result of a partnership between Lombard Odier Investment Management (LOIM) and Affirmative Investment Management (AIM). *Environmental Finance* named it Green Bond Fund of the Year in 2018.

The fund managers say their corporate mission is "for all investments to support the Paris Agreement and Sustainable Development Goals".

The 2019 impact report is the third annual report produced for the $322 million fund. It covers 93% of the fund's 2019 holdings and AIM says: "We believe our impact reports represent some of the most comprehensive impact records available in the marketplace for a debt product".

The company endeavours to enhance its report each year and the 2019 report includes, for the first time, calculations of the carbon metrics for the fund's investments in line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), including the weighted average carbon intensity (WACI) and physical risk screening.

Frequency: Annual

Pages: 51

Weighted portfolio coverage: 93%

Metrics:
- 57,277 tonnes of GHG avoided per year
- 60 MW clean energy capacity installed
- 228,291 MWh clean energy generated
- 19,586 Daily passenger capacity for low carbon transport
- 322,952 m^3 of water treated daily
- 12,774 m^2 of green buildings by floor area
- 696 Students with access to green education facilities
- 1,977 Children immunised
- 165 Jobs retained/created
- 14,685 Microfinance and SME loans
- Carbon profile, metrics and footprint

To estimate its portfolio GHG emissions, AIM collaborated with climate data specialists at ISS ESG and used the open-source Carbon Yield methodology.

Additional metrics: Portfolio physical risk assessment – analysis of the risk to assets financed by bonds held by the fund in various temperature scenarios.

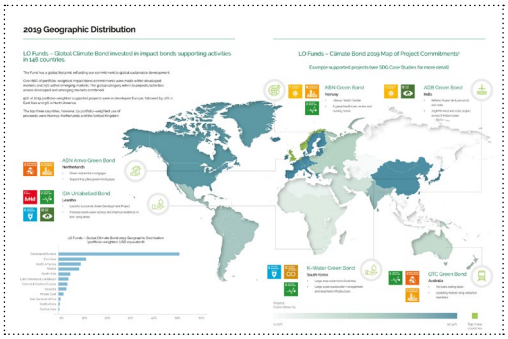
To assess the physical risk facing its holdings, AIM worked with sustainability consultants South Pole to develop a TCFD-aligned climate-related risk tool.

UN SDG aligned – 17/17

Other alignments – TCFD (carbon profile, carbon metrics, carbon footprint and avoided emissions), Paris Agreement

Portfolio composition – Detailed breakdown, including by sector and by bond type

Geographical distribution – Bond project locations shown on a map (see below)

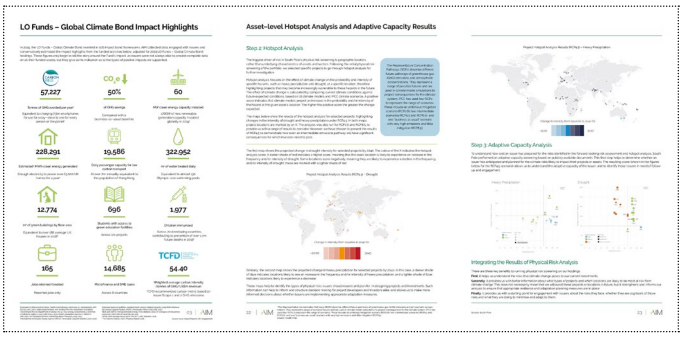


Methodology – 6-page explanation of report aggregation and key metric calculations with carbon intensity equations included

Case studies – 6, from different industry sectors and different countries, highlighting the impact KPIs and the projects' contribution to the SDGs

Also included: AIM's own corporate responsibility and operational carbon footprint. A list of sectors eligible for investment based on AIM's internal taxonomy, explanation of 'SPECTRUM'-aligned investments (unlabelled bonds which fulfil AIM's internal criteria)

Not included – Detailed financial performance of the fund (available separately in monthly and annual fund factsheets)



Case Study – Mirova Green & Sustainable Corporate Bond fund

Mirova is an affiliate of Natixis Investment Managers, dedicated to sustainable investing. Its aim is to combine long-term value creation with sustainable development by following its conviction investment approach. Mirova focuses on innovation in sustainable finance and the fund managers are supported by an in-house team of 10+ responsible investment analysts.

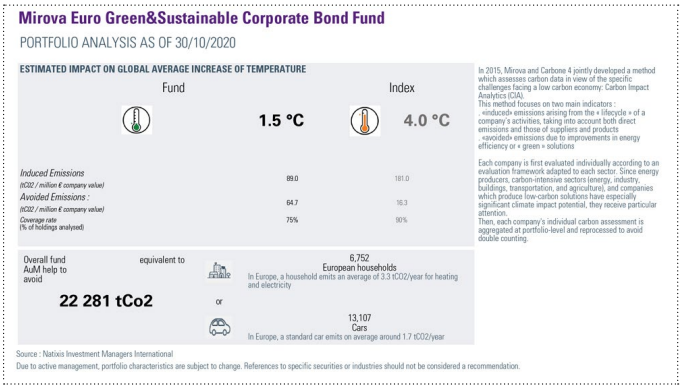
The monthly impact report on the Green & Sustainable Corporate Bond fund (summarised below) is augmented by an annual Mirova impact report which covers all asset classes and includes more detailed explanations of methodologies and impact metrics.

Frequency: Monthly

Pages: 6

Weighted portfolio coverage: 75%

Metrics:
- Induced Emissions – 88.2 (tCO_2 / € million company value)
- Avoided Emissions – 65.6 (tCO_2 / € million company value)



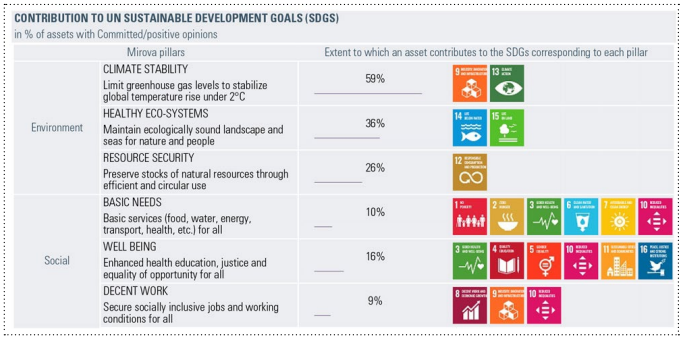
In 2015, Mirova and French consultancy Carbone 4 jointly developed a method which assesses carbon data in view of the specific challenges facing a low-carbon economy: Carbon Impact Analytics (CIA). The method focuses on two main indicators:
- 'induced' emissions arising from the 'lifecycle' of a company's activities, taking into account both direct emissions and those of suppliers and products; and
- 'avoided' emissions due to improvements in energy efficiency or 'green' solutions.

Each company is first assessed individually according to an evaluation framework adapted to each sector. Since energy producers, carbon-intensive sectors (energy, industry, buildings, transportation, and agriculture), and companies which produce low-carbon solutions have especially significant climate impact potential, they receive particular attention.

Then, each company's individual carbon assessment is aggregated at portfolio level and reprocessed to avoid double counting. Until the official report is issued and analysed by Carbone 4, green bond evaluations are based on sector averages and the distribution of the use of proceeds. Once aggregated, a portfolio's coherence with various climate change scenarios can be calculated.

Additional metrics: Sustainability rating of issuer, estimated impact on global average temperature increase

UN SDG aligned: 16/17 with % contributed



Other alignments: 2°C compatible pathway (Paris Agreement)

Portfolio composition: Breakdown by issuer type but not by sector
Geographical distribution: Yes – as a % of holdings

Methodology: Brief reference to methodology Mirova developed with Carbone 4. Additional methodology information is available on Carbone 4 website

Case studies: None

Also included: Detailed financial performance, top 10 holdings, credit rating breakdown, issuer type breakdown, impact equivalencies to households and cars

Not included: Detailed methodology, metrics other than avoided and induced emissions

Green bond investors – what do they want?

Green bond funds represent a small minority of overall green bond investments, with most investors in such funds also buying bonds directly in the primary market.

But there is clearly growing demand for green bond funds and several new ones have launched in 2020 with still further preparing to launch in 2021. They offer several advantages for many investors. Firstly, they can offer access to geographical regions or smaller projects that would not otherwise be accessible, or offer 'ticket sizes' big enough, for many large-scale investors.

Secondly, the due diligence and research required to gauge the 'greenness' of individual green bonds and their issuers can be time consuming, especially if an investor has exclusionary criteria and certain sustainability thresholds which must be met before investing. Leaving this task to the managers of a green bond fund which adheres to stricter green criteria than most issuers can save investors much time and effort.

We surveyed 21 prominent investors in green bonds and green bond funds about their impact reporting expectations and preferences. Just under half of those surveyed work for institutions managing assets of more than $50 billion and 15 of the 21 manage more than $10 billion.

Although the survey focussed on green bonds and green bond funds, it revealed that eight out of ten investors who hold green bonds are also invested in social and sustainability bonds. This suggests that most green bond buyers have impact targets and strategies that are based not solely on environmental factors but also social and sustainability metrics. In light of the fact that issuance of social and sustainability bonds is currently rising faster than that of green bonds (largely in response to the Covid-19 pandemic) it seems likely that, in future, more funds will include these newer instruments alongside green bonds.

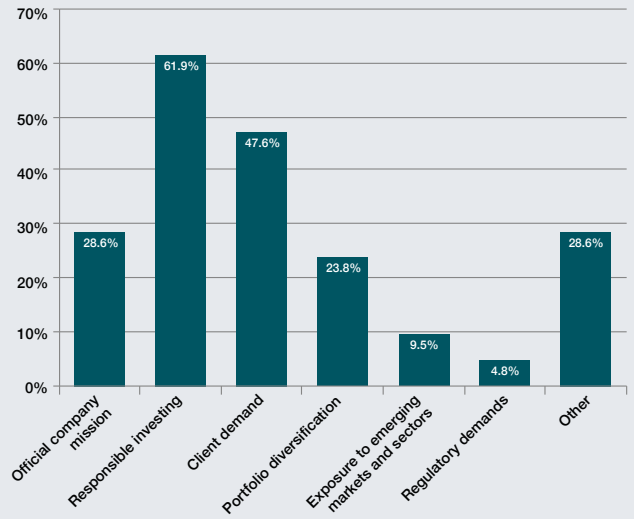
Green bond funds and other investors in green bonds have an important role to play in helping issuers understand what impact metrics and reporting practices are expected of them. Similarly, funds' own impact reports can play an important role in attracting new investors and updating and retaining the support of existing investors.

Green bond investment strategies

When investors were asked about their motivations for investing in green bonds, more than six out of ten cited their commitment to sustainability and responsible investment. (see Figure 9) This is a fast growing trend across all asset classes. According to investment research firm Morningstar, in the first half of this year, net inflows into ESG funds in the US reached $21 billion, close to the total amount recorded for the whole of 2019 (which was itself a record). This is not surprising when the performance of such funds is examined. BlackRock, the world's largest asset manager, reported that 88% of sustainable funds that they analysed outperformed their non-sustainable counterparts in the period 1 January to 30 April 2020.

Client demand was named as a driver by almost half of investors,

Figure 9: What are your firm's motivations for green bond investment?



reflecting pension fund members and others taking a more active role in communicating their preferences for socially and environmentally conscious products. There is a growing trend amongst asset owners, especially pension funds, in reporting the environmental impact of their investments to their clients and incorporating client feedback into their investment decisions.

According to Stephen Liberatore, head of ESG/impact – global fixed income at Nuveen: "After our financial performance, we believe the next most important data we can share with our investors is what outcomes are being generated from the deployment of their capital. As a result, an impact strategy is a

Figure 10: What percentage of your firm's fixed income AuM are in green bonds/green bond funds?

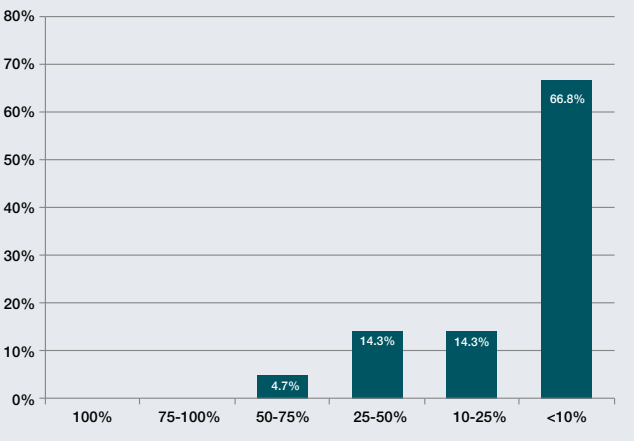
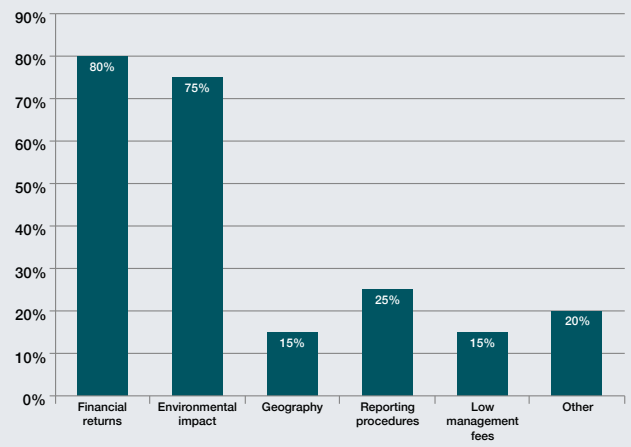


Figure 11: What are your firm's main criteria when choosing a green bond fund to invest in?



true double-line mandate. It is imperative that asset managers understand the critical importance of being able to report on both."

However, while green bonds offer fixed income investors a valuable opportunity to make a positive environmental impact, they remain less than 5% of the global bond market. As a result, two-thirds of our survey respondents said green bond investments – either through funds or direct purchases – represent less than 10% of their firm's fixed income portfolio.

This helps explain why several investors in green bond funds said they found it difficult to justify allocating much time and resources to fully engage with the impact that the fund is making as this is dwarfed by contributions from the rest of the firm's portfolio.

Our interviews with investors revealed that some are sufficiently reassured by the fact that the bonds they hold have been labelled as green or that the funds they invest in hold mainly labelled bonds.

This echoes the survey finding that 'environmental impact' is a major investment criterion for three-quarters of green bond fund investors but only a quarter said the same of 'reporting procedures'.

This raises questions over the need to improve fund level impact reporting and whether the time and resources that would be required to improve the transparency, accuracy and scope of fund level reporting could be better used elsewhere.

Other market insiders, however, make the counter argument that now is the time to get standardised, consistent impact reporting at the issuer and fund level in place while the market is still in its infancy. Green bond investors, included many of the funds surveyed, who have more stringent criteria for the analysis of impact reports are impeded by the current fragmented, unstandardised nature of the market.

If the green bond market continues its rapid growth, then investors' focus on impact reporting is also likely to grow, particularly as regulatory pressure is mounting for better disclosure of ESG performance across the financial sector (see page 5). It could be that current reporting practices by green bond funds are generally good enough for now but will have to improve in the near future.

"Asset owners and investors will want more detailed information on the impact that is achieved with green bonds or green bond funds," said Colette Grosscurt, responsible investment officer at Dutch asset manager Actiam. They will need this to check "whether they are on the right track to reach their targets and to provide transparent reporting to clients, authorities and society as a whole."

And, she added, as the green bond market grows, the need to distinguish between bonds on their impact will increase – "not only to mitigate the risk of greenwashing … but also because there will be more impact to choose amongst."

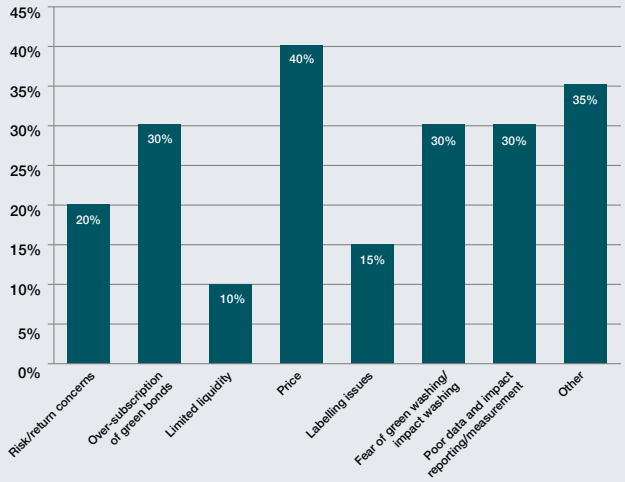
Joshua Linder, credit analyst and fixed income sustainable finance lead at APG Asset Management agrees: "we expect investors will continue to demand more granular impact reporting going forward. As the green bond market grows and expands into more sectors, the importance of accurate and detailed impact reporting will only be greater from an investor perspective."

Financial returns was considered the single most important criterion in selecting a green bond fund, which shows that fund managers cannot afford to prioritise environmental impact to the detriment of financial returns.

Pension funds, with long-term financial responsibilities to their members, make up a large proportion of the investors in green bond funds (three-quarters of the green bonds funds surveyed have private pension investors and 71% have public pension investors). Consequently, financial returns will always be critically important to green bond funds and must be considered alongside environmental impact when selecting which green bonds to invest in.

The importance of impact reporting

Figure 12: What challenges or barriers prevent your firm investing more in green bonds or green bond funds?



Another possible reason for the apparent low level of investor engagement in impact reporting could be the lack of standardisation in the data and the way it is reported which makes it difficult to compare the relative impacts of different funds and bonds. Of the investors surveyed 30% rated a lack of impact data as a barrier to them increasing their investment in green bonds and green bond funds. (see Figure 12)

A further 30% cited fears of greenwashing as a major barrier to increasing their investment, fears which could be allayed with more transparent, standardised, and rigorous impact reporting practices at both a fund and issuer level.

As Figure 13 shows, nine out of ten respondents said they considered impact reports 'crucial' or 'nice to have', underlining the importance of fund level impact reporting.

This seems to be at odds with the finding that less than half of

Figure 13: How important are green bond issuer/fund impact reports?

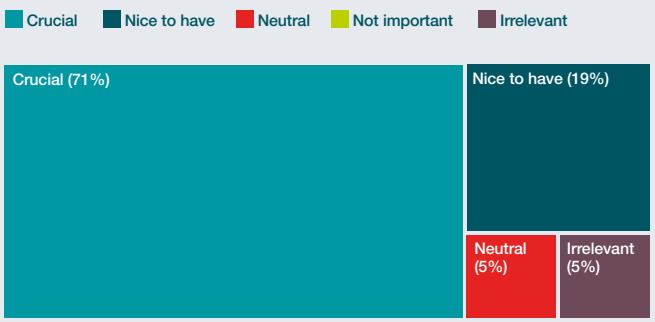
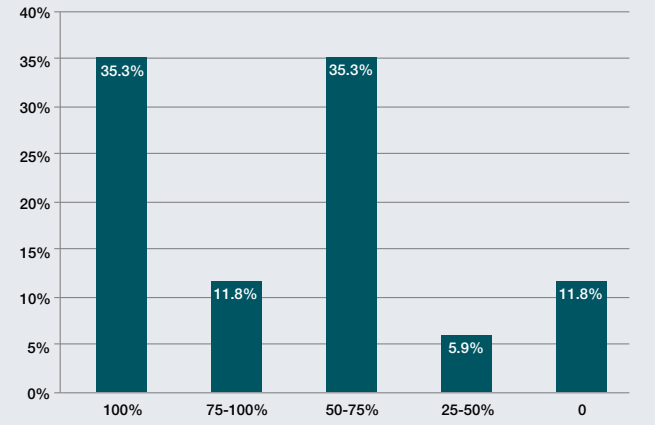


Figure 14: What proportion of the green bond issuers/funds your firm is invested in have issued impact reports?



investors have received impact reports from more than 75% of their green bonds or green bond funds.

This discrepancy could be explained by the immaturity and rapid growth of the market. A huge number of green bonds and many green bond funds are less than 12 months old and are therefore not yet at the impact reporting stage of maturity. Another factor could be the leeway granted to issuers and funds who are still developing their impact reporting practices. Only a tenth of investors would consider divesting if impact reporting does not meet their expectations, whereas more than 70% would rather engage with fund managers and issuers to improve their reporting.

Seven out of ten investors also revealed that they have no formal impact target for their investments and only 36% have a formal review process of the impact reports they receive. Just over half have specific UN SDGs in mind when they make investment decisions.

The lack of formal targets and reviews may be a reflection of the lack of standardisation in the market and the uneven nature of impact reporting practices. A more formalised review and target process would hold issuers and funds to a higher standard of impact reporting.

Reporting preferences – metrics

There is strong correlation between the impact metrics which investors are most interested in and the metrics against which green bond funds report. GHG emissions reduced/avoided is the most sought after by investors (90%) and 81% of green bond funds

Figure 15: Investor Survey – What environmental metrics are your firm most interested in?

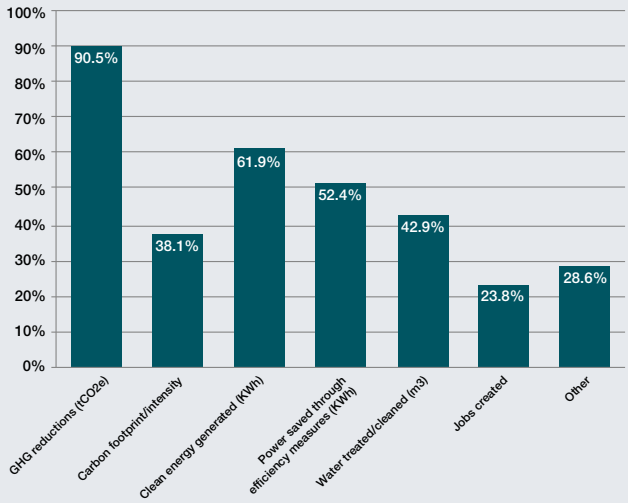
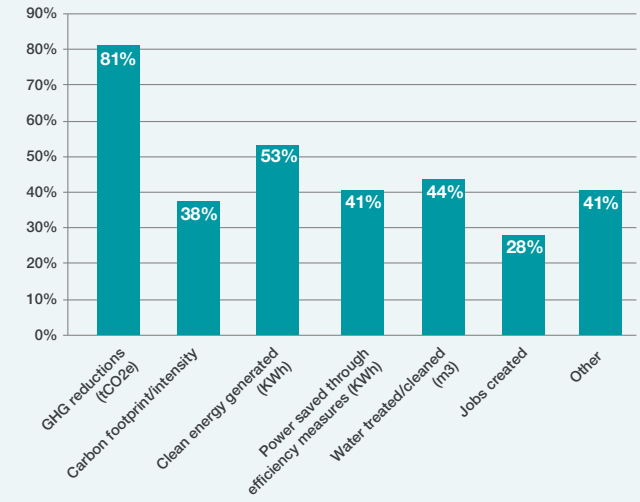


Figure 16: Fund Manager Survey – What environmental metrics does your impact report cover?



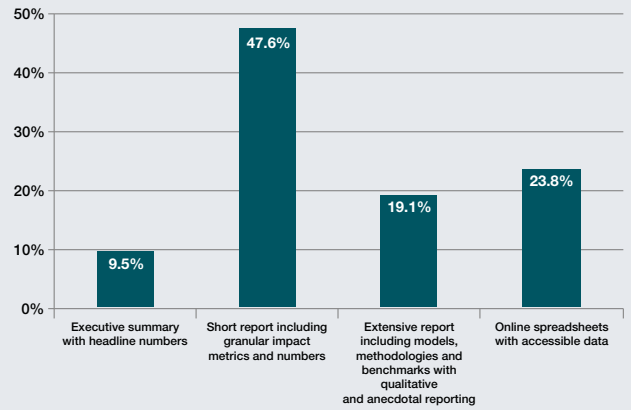
report using this metric.

The similar profiles of Figures 15 and 16 show that green bond funds are supplying the impact metrics which investors consider most important. Funds can play an important role in encouraging and communicating with bond issuers to report the impact data on the metrics which are of most interest to investors.

Reporting preferences – format and presentation

When asked about the format and frequency of impact reports, four out of five investors said they prefer to receive green bond and green bond fund impact reports annually. This is in line with current fund reporting practices where 64% release annual impact reports. The format and size preferences outline the broad spectrum of investor engagement with impact reporting. (See Figure 17) Almost half said they are happy to receive a short report provided it contains granular impact metrics and numbers. One in five, however, would prefer an extensive report with the methodologies, benchmarks and modelling all included.

Figure 17: What format and size would your firm prefer for the impact reports?



A similar percentage would like to have the information presented in spreadsheets to enable them to download it into their own databases.

The differing expectations of investors make impact reporting challenging for green bond funds and may partly explains the diverse approach to impact reporting by the funds [see pages 8-13 and Table 1]. There is a strong argument that allowing market and investor pressure to define the depth of impact reporting at a fund level will lead to the most sustainable reporting practices without creating too many barriers to entry which could limit the proliferation of green bond issuance and new funds.

Christopher Wigley, an independent ESG fixed income portfolio manager, explains: "One problem of regulation is that it sets in stone requirements until legislation is revised. It is not ideal for fast changing or innovating markets. 'Soft regulation' or encouragement to use global standards are better… What is good I believe also about the green bond market is that issuers enjoy innovating impact metrics; and that also, such innovation sometimes has a positive influence on the whole company or organisation in terms of sustainability."

Multiple fund managers have recognised investor demand for case studies of projects financed by bonds in their portfolio and many impact reports include photographs to make the projects more tangible. This underlines the importance of communicating impact in a variety of formats and channels to satisfy the varied fund investor engagement expectations.

Timothée Jaulin, head of ESG development & advocacy, special operations, at Amundi EGO, for example, reported requests from investors for more qualitative information on the projects being financed by the EGO fund. Amundi responded by providing further qualitative data and commissioning case studies, including one using drone footage of a wind farm in Turkey which was supported by one of the bonds in the Amundi fund portfolio.

Grosscurt at Actiam agreed: "the financial sector is often tempted to communicate about performance in as many numbers and graphs as possible, but if we want to be more transparent about where money goes and reach more people, providing more qualitative information in the form of, for example videos or case studies, is essential.

"Telling the story behind the numbers and making it personal or local, allows us to gain an even better understanding of the impact of investments."

The future – what fund investors want more of

According to 60% of survey respondents, current impact reporting practices are inadequate for their needs. While this is a clear message that impact reporting practices at an issuer and fund level need to evolve; it will surprise many that 40% of respondents see no significant disconnect between investor expectation and impact reporting reality.

According to the survey the two elements of impact reporting where investors are most concerned to see improvements are transparency and standardisation.

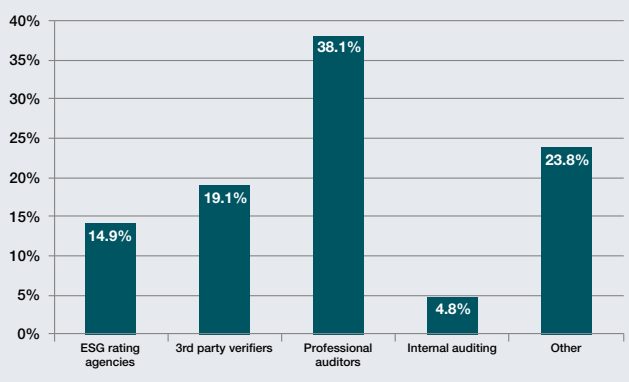
One investor called for "more transparency on the level of ambition", while another said there was a need for improvements in "timeliness, standardisation and comparability". One potential avenue to improve the comparability of fund and issuer level impact reporting would be the auditing of the impact reports. Two out of three investors surveyed said impact reports should be audited. Such audits could be absorbed into annual reports and professional auditors would treat them in the same way as financial reports.

However, standalone impact reports – the preference of (61% of respondents) – could also benefit from auditing as this process could lead to the standardisation of impact metrics and methodologies and the transparency of reports.

Just over half of respondents think any auditing of impact reports would be best undertaken by professional financial auditors. Industry insiders note that these firms have already built up considerable infrastructure for analysing ESG issues and could potentially apply this expertise to the green bond market, thereby adding more credibility to the accuracy and standardisation of impact reports.

The fragmented ESG rating agencies were the choice of only 15% of investors to carry out the auditing function. (See Figure 18). Several investors said the industry suffers from 'agency arbitrage' as a result of their differing evaluation criteria. According to some investors, many companies know which agency will give the most positive ESG rating to certain industry sectors . The choice of agency could thus have a major influence on the audit result which would limit their value to investors.

Figure 18: Who should audit impact reports?



Future trends in impact reporting

More funds

The green bond universe is growing rapidly and spinning off related markets in social and sustainability bonds. Green bond funds are also proliferating, and we have already identified a number of new funds which are likely to fulfil our >50% labelled green bond portfolio criterion. [see Table 2]

More metrics

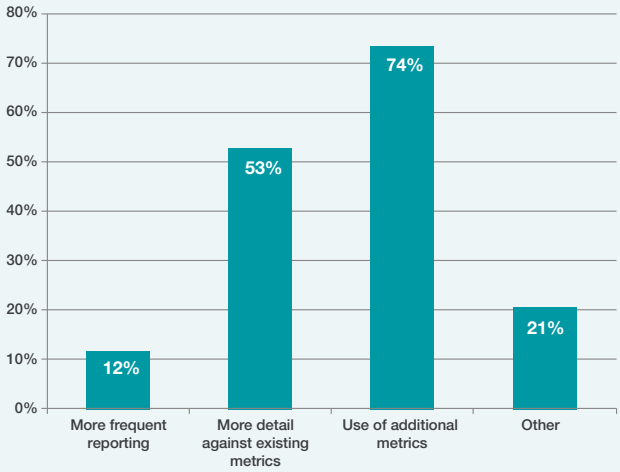
Over 70% of our fund manager survey respondents expect their impact reports to incorporate additional metrics in future. At present, most of the reported metrics are related to climate change mitigation, but some bond issuers have begun reporting on metrics associated with biodiversity, pollution prevention and climate change adaptation. At the same time, more than half of the funds we contacted said they expect future reports to provide more detailed impact data using existing metrics.

More technologies

Beyond the enhancement of existing impact reporting practices there are also exciting advancements in fintech which have potential applications in green bond impact reporting:

- **Blockchain** – can be used to transparently store and manage issuer impact data. An example is The Green Asset Wallet platform which is used by BlackRock and Ohman for their green bond funds.
- **Machine learning, Artificial intelligence , and NLP (Natural Language Processing)** – can be used to scrape impact data from impact reports and to fill in data gaps and to improve impact projections. There are also applications for advanced climate risk modelling to inform investment decisions and improve funds' exclusionary criteria. Examples include Four Twenty Seven's FI Risk Score, TrueValue Labs, Impact-cubed and Arabesque.

Figure 19: How do you expect your impact reporting to change in future?



More analysis

- Monetization of impact – as being developed by Y Analytics, for example – translates various impacts from all sectors and metrics into a common unit to allow for more transparent comparisons.
- Some market observers have questioned the additionality of green bonds that refinance existing debt rather than funding new projects. There is also an important debate underway about the distinction between 'outcomes' and 'impact' and different ways for investors to calculate their impact. This is discussed in detail in a paper by Credit Suisse.

Table 2: New funds

Name	Base currency	Launch date	Size (million)	% labelled Green Bonds
PIMCO GIS Climate Bond Fund	US Dollar	23/09/2020	$24.00	Unspecified
Evli Green Corporate Bond fund	Euro	01/08/2020	€100.93	Unspecified
RobecoSAM Global Green Bonds	Euro	01/05/2020	€15.46	95.60%
Generali Investments SICAV (GIS) Euro Green & Sustainable Bond	Euro	16/12/2019	€148.96	>70% green and sustainable
NN Corporate Index and Green Bond I	Euro	26/11/2019	€101.52	Unspecified
Mansartis Green Bonds	British Pound	31/10/2019	£11.42	>80% green and sustainable

Glossary

EU Green Bond Standard

A voluntary EU Green Bond Standard was recommended in a report from the European Commission's Technical Expert Group on Sustainable Finance in June 2019 "to enhance the effectiveness, transparency, comparability and credibility of the green bond market and to encourage the market participants to issue and invest in EU green bonds".

The report calls for mandatory reporting on the use of proceeds and on environmental impact and recommends that projects funded by green bonds should have to align with the EU Taxonomy. In addition, it proposes a registration system for companies providing external reviews of green bonds.

A consultation on the report was carried out between June and October 2020 and a decision on how to take the idea forward is expected before the end of the year.

EU Taxonomy for Sustainable Activities

The Taxonomy was created as part of the EU's Sustainable Finance Action Plan to provide a classification system for sustainable activities. It is intended to help investors, issuers and other companies to navigate the transition to a low-carbon, resilient and resource-efficient economy. The Taxonomy sets performance thresholds for economic activities which:

- make a substantive contribution to one of six environmental objectives (climate change mitigation, climate change adaptation, protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems).
- do no significant harm to the other five, where relevant; and
- meet minimum safeguards (e.g. OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights).

Green Bonds

Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects and which are aligned with the four core components of the Green Bond Principles (GBP).

Green Bond Principles (GBP)

The Green Bond Principles (GBP) are voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the green bond market by clarifying the approach for issuance of a green bond. The GBP have four core components:

- Use of Proceeds
- Process for Project Evaluation and Selection
- Management of Proceeds
- Reporting

Greenhouse Gases (GHGs)

The UN identifies seven main greenhouse gases (GHGs) that is says are major drivers of climate change. They are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

As CO_2 is by far the most common GHG caused by human activity, it is sometimes used as a shorthand expression for all greenhouse gases. The other GHGs are all more potent in terms of their impact on global warming, but they can be compared with reference to the impact of CO_2. For example, 1 tonne of methane is equivalent to 25 tonnes of CO_2.

Handbook – Harmonized Framework for Impact Reporting

The first Harmonized Framework for Impact Reporting was issued in March 2015 by a working group of four multilateral development banks (the African Development Bank, the European Investment Bank, the International Finance Corporation, and the World Bank).

It outlined core principles and recommendations for impact reporting and included key indicators and reporting templates for energy efficiency and renewable energy projects. Subsequent frameworks have provided indicators and templates for reporting on other categories of eligible projects as identified in the Green Bond Principles.

The handbook, published in June 2019, pulls together all these frameworks into one document with the aim of enhancing their usability and avoiding repetition.

For more detail on the Harmonized Framework, see page7.

International Capital Market Association (ICMA)

ICMA is a not-for-profit association representing about 600 organisations in 62 countries. They include private and public sector issuers, banks and securities houses, asset managers and other investors, capital market infrastructure providers, central banks, law firms and others.

ICMA serves as the secretariat of the Green Bond Principles (and the related Social Bond Principles and Sustainability Bond Guidelines).

IRIS+

IRIS+ is a free, publicly available resource, managed by the Global Impact Investing Network (GIIN), that aims to help investors measure, manage, and optimise their impact.
Among its key features, it includes:

- Sets of core metrics to increase data clarity and comparability. These are backed by evidence and based on best practice across the industry.

- A thematic taxonomy based on generally accepted impact categories and themes.
- A catalogue of standardised social and environmental performance metrics used by leading impact investors.
- Alignment with the SDG Goals and targets.
- Alignment with other major metrics frameworks, standards and conventions.

GIIN claims that half of all impact investors and the majority of fund managers, banks, and development finance institutions use IRIS+ metrics.

Nordic Public Sector Issuers: Position Paper on Green Bond Impact Reporting

This paper was first published in 2017 by a group of public sector issuers of green bonds in the Nordic region. A second edition was issued in 2019 and a third in February 2020.

It is intended to complement the Harmonized Framework for Impact Reporting while recognising specific factors relevant to Nordic bond issuers, such as the baseline emissions factor for the Nordic electricity system.

The Nordic authors say their aim is to deliver reporting that can be compared and aggregated between issuers, but they acknowledge the challenges resulting from different methodologies and metrics being used. Hence, they say: "we suggest caution to be exercised when such comparison or aggregation is undertaken".

Operating Principles for Impact Management

These Principles were launched in April 2019 to provide a framework for investors to ensure that impact considerations are purposefully integrated throughout the investment life cycle.

They were developed by IFC in collaboration with a group of asset owners and investment managers and cover the following aspects of impact investing: strategic intent; origination and structuring; portfolio management; impact at exit; and independent verification. They define impact investing as" "investments made into companies or organizations with the intent to contribute to measurable positive social or environmental impact, alongside financial returns."

Paris Agreement on climate change

The Paris Agreement is a binding UN agreement to strengthen the global response to climate change by keeping the average global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. It was agreed at the annual UN climate change summit in Paris in 2015 but entered into force in November 2016.

Social Bonds

Social Bonds are 'use of proceeds' bonds that raise funds for new and existing projects that address or mitigate a specific social issue and/or seek to achieve positive social outcomes.

Social Bond Principles

Like the GBP, the Social Bond Principles (SBP) are voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the social bond market. They have the same four components as the GBPs.

Sustainability Bonds

Sustainability bonds are bonds whose proceeds will be used exclusively to finance or re-finance a combination of both green and social projects. To be labelled as Sustainability Bonds, they must align with the four core components of both the GBP and SBP with the former being especially relevant to underlying green projects and the latter to underlying social projects.

Sustainability Bond Guidelines

These voluntary guidelines were issued to help ensure the integrity of the fast-growing market for sustainability bonds. The four core components of the GBP and SBP and their recommendations on the use of external reviews and impact reporting also apply to sustainability bonds.

Sustainable Development Goals (SDGs)

The 17 SDGs were adopted by the United Nations in 2015 as the cornerstone of its 2030 Agenda for Sustainable Development. They acknowledge that many environmental and social objectives are interlinked and are increasingly being referenced by companies and investors in their impact reports. The goals are:

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequality
- Sustainable Cities and Communities
- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life on Land
- Peace and Justice Strong Institutions
- Partnerships to achieve the Goal

Task Force on Climate-related Financial Disclosures (TCFD)

The TCFD is an industry-led task force created by the G20's Financial Stability Board to develop voluntary climate-related financial disclosures that would be useful to investors and others in understanding material risks.

It is chaired by Michael Bloomberg, founder of Bloomberg LP and, by September 2020, it had been endorsed by 1,500 organisations globally, including over 1,340 companies with a market capitalisation of $12.6 trillion and financial institutions responsible for assets of $150 trillion.

Sources: Environmental Finance, European Commission, Global Impact Investing Network, ICMA, IFC, Kommuninvest, UN Department of Economic and Social Affairs, UN Framework Convention on Climate Change