CANDRIAM
A NEW YORK LIFE INVESTMENTS COMPANY

Beyond the Green Bond:

A Sustainable Future for IG Credit?

JULY 2024

Marketing communication

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Executive summary.

A sustainable plan for investing in European Investment Grade credit

> **It is our Conviction that companies which embrace sustainability-related opportunities and challenges in combination with financial opportunities and challenges are the most likely to generate value.**
>
> **-Wim van Hyfte, Global Head of ESG Investment & Research**

New European regulation on transparency, new types of bonds with sustainable 'features', and new types of risks lie along the road to Euro investment grade credit, adding to the existing challenges -- and the rewards. While the new transparency is positive and should enhance the sustainable market in Europe, the European regulation is complex. The financial sector is a huge 35% of the Euro benchmark index,[2] requiring extra vigilance of these often opaque and global balance sheets.

If, as we expect, this increased transparency will increase the interest in sustainability in European fixed income markets, it will also increase the need for careful fundamental analysis and pricing of risks. It should provide performance opportunities for active and analytical investors. Notably, IG credit is asymmetric, with the rewards going to those who are able to forecast and price risks and avoid credit accidents. Governance, an extra-financial factor, has long been an indicator of credit-worthiness. We believe other extra-financial factors, including environmental and social factors, are already helping manage downside risks.

We both integrate extra-financial factors, and exclude certain companies and even sectors. Some sector exclusions represent strong Convictions, perhaps even ahead of the markets, with some ESG labels beginning to require it. Comparing sector correlations in European equities to those in European credit shows that in IG bonds, sectors move so closely together that the much-discussed potential for sector bias is less pronounced in IG bonds.

The net zero pathway is likely to become a financial risk as well as an extra-financial one, judging by the comments of the annual Davos Forum.[6] We demonstrate why we believe a portfolio carbon footprint is a strong step towards more concrete measurement of the financial risk. And opportunities? For those investors who are 'fishing' in the depths of the commercial real estate segment, green buildings may be an indicator of which properties are less expensive to maintain and more likely to benefit from rising occupancy. Bank debt, too, may show more winners and losers if a 'climate capital buffer' is introduced in Europe.

New GSS formats – green bonds, social bonds, sustainable bonds, and sustainability-linked bonds – are not only offer new opportunities to sustainable investors, but offering new information and transparency to all investors as issuers report increasingly useful metrics required by their new formats. Do these bonds sell at a premium, or 'greenium'? Sometimes. Another element to model and monitor.

More transparency, more complexity, more opportunities to evaluate and control risk, more opportunities for active management, and above all, more need for fundamental analysis.

It is our Conviction that both financial and sustainability performance will soon be at the forefront of Euro IG portfolios.

Our ESG Philosophy: Transparency and Analysis.

The ESG Framework at Candriam

Based on our long-standing views of the financial benefits of sustainability, we integrate some level of ESG (Environmental, Social, and Governance) factor analysis across all our investment processes, and particularly for our sustainable investment strategies.

Today, the landscape for sustainable investment grade credit in Europe is complex, and requires the highest possible ESG selectivity at each stage.

- **The European regulatory framework is complex**, and remains open to some level of interpretation by each asset manager. To meet the challenge of regulators, investors, and our own expectations, an 'Article 9' product[1] must be based on a robust ESG selection process at each step to both achieve and report on pre-disclosed Key Performance Indicators (KPIs). Some national sustainable labels, such as the French *Label ISR* and the Belgian *Febelfin*, increasingly insist on a sector exclusion policy as well. This environment will be easier for those managers who already had these methodologies in place, and which are looking forward to continuing specificity.
- **The Financial Sector accounts for a whopping 35%[2] of the benchmark index.[3]** At this weight in the benchmark, we believe our ESG analysis for this industry must be doubly robust. It is difficult to identify financial companies with distinct strategies to produce positive environmental or social outcomes – as they must to qualify under the current regulatory framework. What is the lending, underwriting, or other exposure to fossil fuel? What is the exposure to green activities? What is the company's environmental strategy, such as phasing out financing of coal, unconventional oil & gas, etc? Based on our own individual company

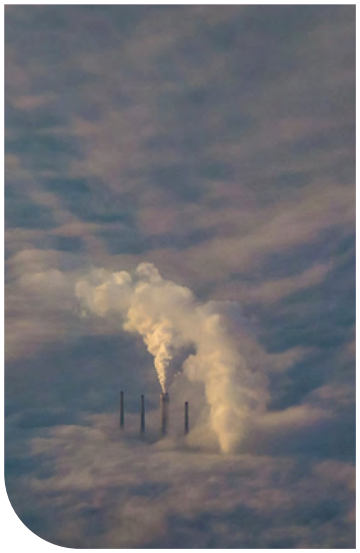
fundamental analysis, only seven of the 17 financial institutions in our European universe are aligned with our Candriam environmental assessment.

- **Utilities contribute 11% of the benchmark, but 25%-30%[4] of the global emissions of CO_2.** For this sector, too, we put extra emphasis on the role of ESG analysis. It is not enough to calculate the proportion of electricity a utility generates from coal and gas. We need to know not only how capital spending is and will be allocated to solar, wind, and other rising technologies but also how will each company reach its target on CO_2/Kwh, its targets for Scopes 1 and 2 emissions, and targets for future energy mix of power generation mix? And what is the risk of stranded assets?
- **Green bonds are not so simple – nor so green.** Sustainable debt, including green bonds, social bonds, sustainability bonds, and sustainability-linked bonds, has grown at a terrific rate from less than €30 billion globally in 2015[5] to €3.3 trillion by December 2023, of which € 1.8 trillion are issued by Euro corporates. We need to ensure that each issue offers transparency in the use of proceeds.

At Candriam, we take the view that not only should the bond finance an environmental or social project, but the issuing company must also be aligned with our holistic ESG approach. If the bond is financing a qualifying green project but the parent issuer is not headed in a sustainable direction, does the risk remain? We think so – this makes the sustainable bond a *No Go* for us.

Integration *and* sectoral exclusion

Since 2009, Candriam has continuously updated our formal and carefully-considered exclusion policy for activities which present risks to investments by way of their risks to the environment and society. We apply some exclusions to all our investments, while our sustainable processes are subject to additional types of exclusions. As for all facets of our sustainable approach, we consider both materiality and consequences.



With €100 billion in investment-grade credit SRI-labelled funds, according to BNP Paribas, what will be the (negative) impact on spreads in the sector if funds have to divest? According to the Financial Times, French oil major TotalEnergies is held by 161 ISR-labelled funds with aggregate holdings of €2.4 billion, representing 1.6% of the company's market capitalization.

These exclusions can be controversial. Take the case of natural gas. One view has it that natural gas is an aid in the energy transition process. Candriam excludes companies with more than 5% of revenues from conventional oil and gas from all our investments. (The International Energy Agency (IEA) scenario indicates that to reach 2050 climate goals, all new fossil fuel investment must cease as of *now*.)

We also make a distinction between conventional producers, and unconventional producers – eg, fracking. We permit the modest 5% exposure in recognition that not all projects can be closed quickly. But given the carbon-intensity and water-intensity of unconventional projects, any company which launches a new non-conventional oil or gas project is excluded.

European funds labels are also tightening their qualifications. Since inception, the Belgian *Toward Sustainability* label (formerly *Febelfin*) has supported the view that certain sectors are incompatible with ESG strategies, or at least should not be included without strong justification or ESG-specific bonds. In late 2023, **the French *Label ISR* was updated to exclude** the worst-rated issuers and from 2025, to exclude coal, **non-conventional hydrocarbons, and new projects in the fossil fuels** -- which will effectively exclude the entire oil and gas sector.

As technologies and societies evolve, so does our approach.

For insight into how we evaluate activities, see our Candriam Exclusion Policy.

Transparency enhances the market

Rising transparency for both company reporting, as financial participant reporting to investors and others, is accelerating the sustainability trend, and perhaps even more rapidly in fixed income.

Several long-term multi-stakeholder efforts, including investors and governments among others, are coming to fruition, especially in Europe. The most important of these, in our view, is the company reporting requirements of the EU CSRD. Together, we believe that these should have a synergistic effect.

- **The Corporate Sustainability Reporting Directive** (CSRD) from the European Union is a game-changer. *In 2024, for the first time, companies in Europe are required to report on sustainability metrics and ESG actions in a comprehensive, comparable, and audited manner.* It will provide comprehensive, comparable, and auditable data for investors and others.
- **The Sustainable Finance Disclosure Regulation** (SFDR), another element of the EU Sustainable Finance effort, requires investment managers to produce that company on a portfolio basis for their investment clients. Among other things, it provides asset owners with transparency on the sustainability aspects of financial products and portfolios.
- **The EU Green Bond Standards** (EuGB) will be strengthened by the end of 2024, and will be required for any issuers which wish to use the designation of *European Green Bond* or *EuGB*. The transparency offered by Green, Social, and Sustainability bonds has led not only to spectacular growth for this still-small sector, but is arguably raising interest in and awareness of sustainability for all of fixed income.

This sharp step up in transparency for companies, investors, and financial participants is a game-changer for all. This initiative focuses on leading data rather than lagged data, particularly on forward-looking decarbonization plans of companies. Together, the CSRD and the SFDR provide transparency for sustainable investing, and for more effective engagement with issuers.

We expect this increased transparency will increase the interest in sustainability in European fixed income markets. It is also increasing the need to careful fundamental analysis and pricing of risks. These movements are here to stay, and will continue to evolve.

For more on our ESG framework, see the Appendix.

Applying a particular ESG approach to the Credit Market.

We strongly believe that fundamental analysis of extra-financial factors can enhance understanding of both opportunities and risks. In IG credit, the asymmetric nature of bond returns leads us to focus on the benefits to risk analysis.

Does ESG analysis aid in prediction of credit accidents?

We believe that credit analysis is a major beneficiary of the inclusion of extra-financial indicators. For how many decades have investors and lenders evaluated the management and Governance structure of an issuer? Doesn't your oldest banking textbook say that it is not just whether the borrower *can* repay his debt, but whether he *intends* to?

Governance factors: Consider the corporate governance of banks, especially with their opaque balance sheets. Insufficient internal risk controls have permitted excessive risk-taking in many cases. Despite layers of (external) regulation, weak internal governance can still trip up those who invest in bank debt. Given the interconnection between confidence in banks and their solvency, not to mention the role of banks in financing the broader economy, lack of internal governance in the sector can affect debt markets overall, even for those not invested in the affected institution. Lack of governance has led to notable bond market events such as the Italian state buy-out of Banca Montei dei Paschi di Siena and the Swiss-government-assisted acquisition of Credit Suisse by UBS.

Social factors: Extra-financial factors such as fair working conditions began to attract more investor attention during the Covid-19 pandemic. Employee quality is a central factor to service quality and a main expense for service businesses such as Teleperformance. This global customer call centre business has both won workforce awards *and generated workforce controversy* – we think the bond spreads reflect these reputational risks (Figure 1). How to look at this? Our answer is two-fold -- fundamental analysis of extra-financial factors, and a multi-year engagement with the company.

Figure 1:
The 'S' in ESG: Teleperfomance bond spreads

The Colombian Labor Ministry launched a probe into working practices in Nov 2022.

Candriam may hold, or may have held, debt or equity securities in any of the companies mentioned in this document. Positive or negative comments on their ESG factors are for illustration, do not indicate our full view on the securities, and do not constitute a recommendation.

Source: Bloomberg, Candriam. Z-spread in basis points.

For a more in-depth look at our company engagement and analysis, see our July 2020 and February 2023 case studies on Teleperformance.

The Net Zero pathway offers risk and opportunities

Climate change is a tangible and material risk for bonds. 'Extreme weather events' was the top-ranked ten-year global risk in the 2024 World Economic Forum Global Risks Report.[6] The road to Net-Zero will be bumpy but necessary, and understanding issuers' exposure to climate change is a key non-financial metric.

For more from Candriam, see On the Green Brick Road to Net Zero.

There are opportunities. Yet given the asymmetric nature of fixed income products, understanding the strategic issues and how the timeline plays out will be central to understanding the risks and impacts within certain sectors, and critical to choosing the right issuers. A few key sectors include autos, aviation, and banks:

The Auto Sector can add climate change and climate regulation to its traditional credit features of capital intensity and economic sensitivity. The transport sector contributes approximately one-quarter of all energy-related greenhouse gas (GHG) emissions globally, half of which is generated by passenger cars, according to the International Energy Agency (IEA). Led by Europe and China, governments around the world are introducing ever-stricter emission regulations. As companies continue to adopt global platforms for cost efficiency, stringent rules in Europe and China will have a global effect.

In anticipation of the future ban on internal combustion engines, auto manufacturers already need to meet stringent emission rules for fleet sales, which are expected to be further tightened. Traditionally focused on more-efficient combustion engines, auto companies must increasingly rely on new hybrid technologies as well as all-electric vehicles. But at what rate will the expensive and capital-intensive transition take place? And what shape will the path take?

Failure to meet emission targets not only results in financially-damaging fines, but lack of progress also puts car companies at a competitive disadvantage as we approach the 2035 deadline in Europe. Government climate initiatives can also create a competitive advantage as much-feared wave of highly- competitive, technologically-advanced Chinese electric vehicles begins to lap at European shores.

Aviation faces very high stakes, given its hard-to-abate carbon emissions (about 2.5% of global CO_2 emissions)[7] and the time expected before Sustainable Aviation Fuel (SAF) or breakthrough technologies such as hydrogen become practical. According to SBTi database, no major European airline has submitted a climate target ambitious enough to help limit global warming to 1.5C above pre-industrial levels.

> **Climate change is a tangible and material risk for bonds. 'Extreme weather events' was the top-ranked ten-year global risk in the 2024 World Economic Forum Global Risks Report.**

The industry improved fuel efficiency by approximately 39% between 2005 and 2019, according to McKinsey, yet the absolute growth in emissions has far outpaced these efficiency gains. Despite capital spending on more efficient aircraft and operational measures, there is a possibility that policymakers—particularly in Europe—will introduce regulation which could shrink the sector.

Airlines are betting heavily on SAF, which IATA estimates SAF could reduce CO_2 emissions by between 24% and 70%. Currently, SAF is three times more expensive than conventional jet fuel and constitutes just 0.1% of global jet fuel volumes. The transition presents significant challenges, as we note in our Candriam paper, Green Innovations: Biofuels.

Those operators that are already investing heavily in the supply chain are the most likely to be able to successfully adopt SAF. Given the increasing costs, this transition might accelerate consolidation within the sector, particularly among European airlines.

Banks face significant changes. Regulators, particularly the ECB, have been vocal about the need for banks to consider climate risk and to be more transparent. In May 2024, the ECB announced its first fines for several banks for their "*protracted failure to address the impact of climate change*".[8] Regulations mandate that banks must assess whether they are, or will be, exposed to material risks, and reflect this in their capital reserves.

That same week, with less comment in the press, the ECB published a ground-breaking paper titled "*Designing a Macroprudential Capital Buffer for Climate-Related Risks*". **Could this ECB paper lead to a 'climate capital buffer' for European Banks?**

The premise of the ECB paper is that an accelerated energy transition is necessary, but could negatively impact some credit profiles. The ECB developed a probability of default (PD) model encompassing energy prices, spillovers, leverage, and profitability. This model suggests that an accelerated transition results in a temporary surge in electricity prices and increased financial leverage for green investments that might lead to higher loan losses for households and particularly for corporates. The model also highlights the likelihood of notable differentiation among bank scores on climate risk.

Given the growing intersection between financial stability and environmental sustainability, we think the introduction of a 'climate capital buffer' could be both imminent, and *substantial*. The paper mentioned additional capital requirements of as much as 200 basis points for some institutions. If so, it could become a significant concern among the affected banks.

Portfolio carbon footprint: Why measure and report ?

The carbon footprint of a portfolio measures not only the carbon impact of the strategy but also its carbon *risk*, including:

- **Financing Risk**: eg, that investors demand a carbon premium
- **Reputational Risk**: shifts in consumer preferences, negative news stories, etc
- **Stranded Assets Risk**: cost to adapt carbon-intensive products, or even plant, equipment, and other assets made worthless by market changes
- **Policy Risk**: for example, the implementation of carbon taxes).

The link between carbon footprint and carbon risk

To demonstrate the relevance of a carbon footprint to a financial carbon risk, we perform a carbon pricing sensitivity analysis.

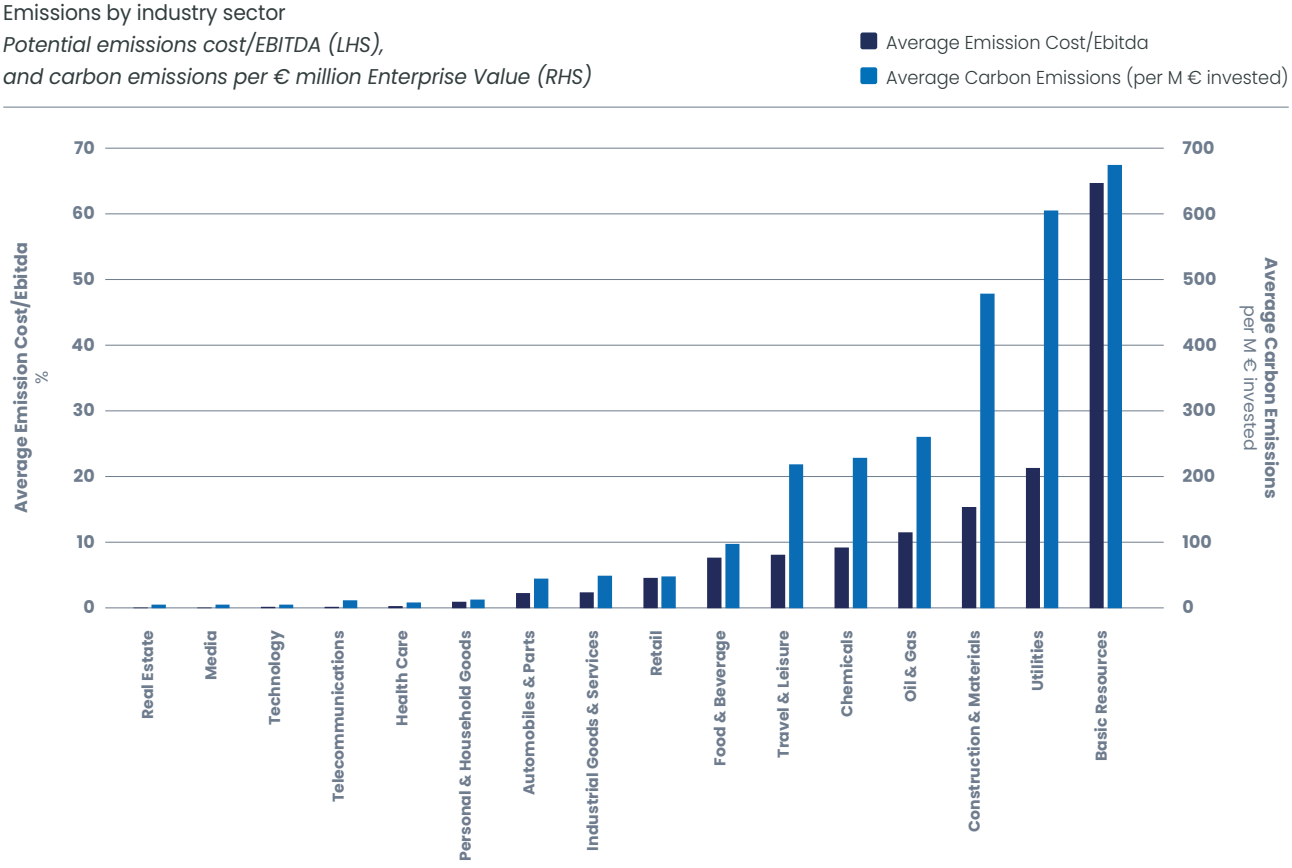
With policymakers worldwide exploring strategies to limit GHG emissions, one widely-discussed approach is carbon pricing, to help the producer include the cost of externalities in production costs, rather than laying these costs off on the climate and the taxpayer.

The EU Emissions Trading Scheme (EU ETS), established in 2005, is a leader in this concept by establishing a quota. The cap-and-trade system sets a maximum total for GHG emissions of covered installations, with the permissible limit decreasing over time. Participants are allocated allowances granting the right to emit one metric tonne of CO_2 equivalent (tCO_2e). Companies exceeding their allowance must buy additional emission rights, while others can sell their surplus allowances, creating a market. Currently, the EU ETS assigns a monetary value to the rights of €66.6 per tonne.[9]

This helps investors analyse the financial risk and sensitivity of an issuer to carbon. **If emissions were suddenly all explicitly priced,** and we assume the carbon price is close to today's EU ETS 'trading price' for carbon, **how would that impact margins and credit quality of each issuer?**

The outcomes by sector are particularly striking.

Figure 2:
Emissions by industry sector
Potential emissions cost/EBITDA (LHS),
and carbon emissions per € million Enterprise Value (RHS)



Source: Candriam, iBoxx, Trucost, Bloomberg.

This illustrates the sensitivity of issuers to a potential carbon tax – and shows that some issuers could suffer dramatic impacts. In some low-margin carbon-intensive sectors, such as basic resources, the carbon tax could exceed half the average EBITDA. If this tax is part of the operating costs, we found that 20 companies in the Euro IG investment universe would experience EBITDA declines of more than 30%! These companies, about 5% of the iBoxx, are heavily exposed to coal, organic chemicals, and cement production, and paper and packaging.

At issuer level, carbon risk analysis should include not only the current footprint, but also the positioning of each company relative to its Sector Decarbonization Approach scenario (SDA), its future decarbonization efforts, and other elements. Among issuers with poor carbon footprint scores, there are differences in strategies that are important to capture from an ESG perspective.

This is why we prefer to consider carbon footprint exposure as a 'systemic' carbon risk and at portfolio level.

The Carbon Budget: At portfolio level we believe **the carbon footprint can provide a good proxy of the 'carbon beta' of a portfolio,** that is, sensitivity of the portfolio value to carbon emissions.

Given the financial risks associated with the net-zero transition, ***we recommend sustainable portfolios target a below average beta for carbon risk. We propose a target carbon beta of 0.7, or 30% below the credit market***. This target also aligns with thresholds set by some of the benchmarks of the EU Climate Benchmarks Regulation.

Within that budget and a sustainable universe, it is up to the investment manager whether to include issuers with high current carbon footprints, if these issuers demonstrate strong potential for forward-looking decarbonization.

What is a Carbon Footprint?

Greenhouse gases (GHGs), including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), have different impacts on heat trapping in the atmosphere, but can be set on a scale of CO_2 equivalence in metric tonnes (tCO_2e). What we call carbon footprint is the measure of the impact of an issuer or investment on the concentration of these gases in the atmosphere. To compare emissions relative to company size, they are often expressed in tCO_2e per million euros of revenue, or per million euros of enterprise value. Using the latter metric allows credit investors to assess the relative impact of corporate debt and compare it to a benchmark.

GHG emissions are considered in three scopes:

- Scope 1: Direct emissions from owned or controlled sources.
- Scope 2: Indirect emissions from the generation of purchased energy.
- Scope 3: All other indirect emissions that occur in the value chain of the reporting company, including suppliers, end-users, and disposal. It is the most difficult and subjective to measure.

Scopes 1 and 2 have the advantage of measuring the footprint attributable to the company's direct activities, and of offering comparability.

For reference, the Carbon footprint of the iBoxx Euro Corporate is 72.9 (tCO_2e) per million euros of enterprise value.[10]

New bond formats increase the tools available to responsible credit investors

Transparency and impact for credit investors: GSS bonds

Green, Social, and Sustainability bonds (GSS) bonds are vanilla debt instruments issued specifically to finance projects with positive environmental, social impacts, or a mix of both. These bonds represent a small but influential portion of the market, with current outstandings totalling € 3 trillion, or roughly 16% of the overall Euro IG universe.

Under the guidelines of the ICMA, issuers of these bonds commit to investors based on four pillars:

- **Use of Proceeds:** The proceeds must be invested in a clearly defined list of impactful projects, such as renewable energy infrastructure, energy efficiency initiatives, sustainable transportation systems, and climate adaptation measures.
- **Project Selection:** A rigorous process and governance structure must be established to select the projects.
- **Management of Proceeds:** Mechanisms must be established to maintain transparency, accountability, and traceability throughout the investment life cycle to avoid green- or social-washing risks.
- **Reporting:** Transparent and comprehensive reports must be published on the impact and performance of the bond-funded projects.

A consistent set of features for investors

Transparency -- GSS bonds provide *transparency*, a critical condition for ESG assessment and development of a company. As their name suggests, Use of Proceeds bonds clearly define the purpose of the projects being funded.

Measurable impact -- Issuers are committed to detailing the measured post-allocation impact of the proceeds through Bond Impact Reports, reporting on impact to investors. Hence, for any euro invested in a GSS bond, investors will know the corresponding impact

Corporate level transparency for sustainable targets -- At issuance, GSS issuers must also explain to investors how these assets relate to the company's overall ESG strategy. **Beyond the transparency of the proceeds, these bonds also allow ESG specialists to test issuers' overall commitments to their sustainability targets** -- for example, the renewable energy targets of utility companies. Some issuers used GSS bonds in an effort to show an ambitious turnaround in their ESG strategy – for example, certain green bond issuers in the auto sector.

The issuance of GSS bonds signals a commitment to transparency, accountability, and stakeholder engagement, which strengthens relationships with credit investors. The initial issuance of a bond issue, or periodic reporting on these measurements, provide opportunities for ESG analysts to engage with issuers.

The growing benefits of GSS bonds, to their issuers as well as to specific issues, makes the inclusion of a minimum proportion of green bonds or Use of Proceeds bonds within credit strategies a sensible target. This ensures improved levels of impact.

The issuance of GSS bonds signals a commitment to transparency, accountability, and stakeholder engagement, which strengthens relationships with credit investors.

Strengthening the market: The new EU standards

So far the GSS credit market has relied on voluntary adoption of voluntary standards. The EU Green Bond standard and label, to become effective from December 2024, is designed to expand the Green Bond market as well as to address greenwashing accusations. It builds on and formalises the voluntary elements of the ICMA industry association's Green Bond Principles, adding both pre- and post-issuance reviews under regulatory supervision. If an issuer wishes to use the designation of *European Green Bond*, or *EuGB*, then these standards are a requirement.

The GSS bond market should be strengthened by three particular requirements:

- **Reviews:** The new external, supervised reviews.
- **Alignment of proceeds:** A requirement that a minimum of 85% of proceeds align with the EU taxonomy (with a 15% band for certain cases).
- **Strategic integration:** The issuer must demonstrate how the bonds aligns with their overall strategy.

Many issuers expressed concern that they may not meet these requirements, potentially slowing GSS sector growth. For example, the 85% minimum taxonomy alignment is challenging because not all economic activities are covered by the taxonomy, particularly those outside Europe.

From Green Bonds, to a mandatory Green Asset Ratio ?

The Green Asset Ratio (GAR) is an example of how green bonds are strengthening sustainability and pushing forward the bond markets. The GAR is a new European disclosure requirement for banks under the Non-Financial Reporting Directive. It quantifies the proportion of assets allocated to environmentally sustainable activities, providing a measurable metric for assessing and enhancing banks' environmental impact.

As always, data is a challenge, and differences in the business mix among banks present an additional complexity.[11] GAR may serve as a benchmarking tool within the banking industry, indicating a stronger emphasis on sustainability. When accompanied by other key disclosures such as exposure to carbon-intensive companies, high GAR values suggest a robust commitment to sustainability in asset allocation. Tracking changes in GAR over time should also help monitor the progress of banks toward their sustainability targets.

Availability and collection of data has been the main challenge for Banks to report on that mandatory metric. **Banks have been one of the major issuers of Green Bonds. Those which have historically made an effort towards balance sheet transparency should find it easier to report mandatory figures.**

Sustainability-Linked Bonds: A New Trend?

Green and Social bonds channel investments into specific sustainable environmental or social *projects*, but they are not a commitment at *issuer* level. This limited scope led to the new concept of Sustainability-Linked Bond (SLBs), for which the issuer commits to ESG targets *for the company as a whole* rather than for just an individual project financed by the bond. In some sectors, capital projects are not that relevant, and an SLB is the only ESG bond that an issuer can issue.

The issuer choses one or more relevant ESG KPIs, a time horizon and a target to this KPI, also called a Sustainability Performance Target (SPT). If the issuer fails to achieve the target at the specified reporting point, the issuer compensates the investor, usually through a step-up of the coupon until maturity of the bond.

Coupon step-ups: Should sustainable investors benefit from ESG failures?

The expansion of the SLB sector can be expected to draw attention to broader market integration of ESG considerations. Most SLBs (99%) include a coupon step-up penalty clause, typically around 25 basis points.[12] This feature, which since 2021 does not prevent the ECB to add those bonds to its purchasing program for bonds tied to a green objective, provides a financial insurance for ESG investors.

Think of the step-up as insurance, not a benefit. We take the view that this is not a reward, but compensation to the holder for the higher level of risk that the bond carries once the issuer has missed a promised target.

On a portfolio level, imagine you are a Sustainable Credit investor with a strong commitment to decarbonizing your portfolio, particularly within the electricity sector. Despite the positive intentions and credible transition plans of certain issuers, many carbon footprints remain high due to the reliance of electricity generation on already-existing coal-fired plants, etc. **By investing in these companies, you are supporting their transition journey, but you also need protection** (especially for a case in which you, or the sustainable market, has to divest from that issuer). If the issuer fails to meet its targets without justification, the coupon step-up provides some financial compensation for the increased risk of the investment, thus in some way hedging your ESG risk against unmet targets.

On a broader financial market level, we expect SLBs will drive deeper integration of ESG considerations across the entire market, including among non-sustainable investors. Be beginning to price the ESG risks through coupon step-ups for missed ESG KPIs, incentives are created for all companies to track efforts to meet their targets. Market-driven scrutiny improves informed opinions and fosters greater accountability. From a technical perspective, the coupon step-up becomes another step towards explicitly incorporating ESG factors into bond pricing. As an example, **SLBs can be a helpful market instrument to track the climate performance of the issuer.**

Both SLB and green bond formats can be used for the same bond issue, despite the differences in the concepts (as has been done by the Austrian utility, Verbund).

Sustainability-Linked Bonds are in their early stages. Challenges for credit investors include a lack of standardization, which complicates the integration of SLBs into investment processes. Investing in SLBs demands a higher level of ESG expertise, and the commitments made are forward-looking, a benefit which adds complexity to the assessment process. Finally, to date some SLB issuances have faced accusations of greenwashing. As for corporate commitments broadly, these accusations often stem from the selection of irrelevant KPIs or from setting targets that are not sufficiently ambitious, sometimes being almost met at the time of issuance.[13]

While the SLB market is still developing and facing challenges, it represents an important step in the evolution of ESG integration.

Sustainable leader Enel missed its target: What next?

From first sustainable performance target to a full sustainable curve. Enel has been among the leaders in this ESG innovation since September 2019 when it issued the first bond ever tied to a commitment to a Sustainable Performance Target. For this first effort, Enel committed to generate 50% of its electricity from renewable sources by the end of 2021,[14] supporting it with a 25 bps coupon step-up in the event of a missed target.

Enel SLB bonds are so numerous that they represent a type of SLB curve. Today, less than 4% percent of Enel's senior curve is *not* an ESG bond (such as an SLB a Green Bond). Enel now represents 13% of the active SLB bonds globally.[15] The effect is felt even down to a representative curve for specific targets such as some of those Scope 1 GHG emissions intensity relating to power generation. (As one of the most relevant ESG KPI for utilities of that type, this is an example of how GSS bonds can lead the credit market to price ESG risks.) That first bond issued in 2019, as well as four other bonds with an observation targets through the end of 2022, met their targets.

Geopolitics and national needs interrupted 2023. To save gas consumption and preserve the stocks, the Italian Government required Enel to temporarily maximise the electricity production from coal-fired power plants forcing Enel to miss its Scope 1 emissions target. Enel was able to avoid the SPT event clause because of the external nature of the government mandate, but the company , nevertheless chose to activate the step-up on ten of its bonds.

The debate over Enel's ESG reputation began (the financial effect was approximately €100m additional interest, a modest figure given the free cash flow of roughly 16bn.[16] The events were outside the company's control, the company commitment was indeed ambitious, and our analysis showed that the event did not affect the strength of Enel's long-term commitment or its ability to meet that commitment. To date, Enel's renewable energy production has grown, while gas consumption has somehow normalized in Europe. We forecast that the 2024 targets for Scope 1 emissions should be met (140 gCO_2/kWh).

Market reaction

If systematization of SLBs should allow bond market pricing to better track ESG commitments, what can we take away from the Enel case?

The miss related to 12 bonds. We use an SLB maturing in May 2026 with a 2023 target, as it is one of the few which we can compare to a non-SLB (We use the ENELIM 0 05/28/2026, a SLB, and the ENELIM 1⅛ 09/16/2026, which is a green bond but does

not have a step-up so we assume its pricing was not impacted.) Did the bond outperform on the premise of a coupon step-up, or underperform because of the ESG 'miss' triggering a sell-off.

Figure 3:
Enel's SLB bond premium vs vanilla Enel bond, assuming a 100% probability that the issuer will fail to meet its SPT
Green bond with step-up vs. traditional bond

Note: We use the ENELIM 0 05/28/2026, a SLB, and the ENELIM 1⅛ 09/16/2026, which is a green bond but does not have a step-up so we assume its pricing was not impacted.

Source: Bloomberg, Candriam.

In theory, when an SLB with a 25 bps step-up is priced at a discount to the curve, a negative premium, all else equal the market is pricing some probability greater than 0% that the step-up will be activated. A 25bps premium should appear if the market prices the probability of a step-up as 100% (see spread already widening in Figure 3).

The opposite occurred for the Enel bond. The miss was announced on April 22, 2024. Counter-intuitively, the bond underperformed a year before the announcement. This means than despite the possibilities of a miss and a step-up of the coupon, there were more sellers (probably ESG holders?) than buyers. Later, the bond began to overperform (were arbitragers buying the price difference after a step-up, and/or some ESG investors agnostic to the KPI)? Eventually, the bonds reached an equilibrium, but far from the -25bps discount that mechanically appeared at the time of the announcement.

Setting aside the ESG considerations, it is interesting to note how slow markets were to react to the probability of that target miss (especially ESG-agnostic investors).

In the end, the buy-and-hold ESG investor who bought the SLB at issuance was compensated for the increased volatility through the roughly 50bps gain at the time of the step-up (See widening of already-positive spread between green and traditional issue in Figure 1).

Sustainable *performance.*

Two concerns appear to dominate the Sustainable investing community in recent quarters -- the risk of underperformance, and the risk of green-washing (including 'social-washing') – across all asset classes. Regulation and the strengthening of ESG frameworks across most of the industry have been helping to moderate these latter concerns.

To the point: Is there a performance cost to sustainable investing, specifically in Euro Investment Grade Credit? Sustainable, but *at which* cost ?

The volatility of the ESG risk premia: The 'Greenium', or cost of green bonds

The definition of a 'sustainable' company, or a 'good ESG issuer', is subjective and not standardized. Academic research defining the impact of ESG factors on bond premia is complex and often reports inconsistent results. ESG investors intuit that, at certain points in the market, the risk premium on a bond may be lower due to its ESG features. This is how, as we'll see later, for example, spreads of a Sustainable universe are in general lower than the one of the broader universe.

There is however an existing specific segment of the ESG market, which can help to show how investors are able to put a premium on ESG attributes -- with the green bond market.

Defining a green bond premium

Green bonds are highly sought after by investors with the potential consequence that all else equal, they might accept a lower yield compared to a conventional bond with no specified use of proceeds. From a an ultimate risk perspective, green and non-green bonds share the same cash flow risks, as green bond investors do not have specific rights to the underlying assets.

Moreover, because the reporting is public, the impact and transparency of green bonds are actually available to all market participants.

Finally, unlike Sustainability-Linked Bonds (SLBs), green bonds do not offer financial protection against potential volatility if the ESG features are not met (though such occurrences are remarkably rare).

In practice, in Credit, some observers have reported a statistically significant yield differential developing by 2020.[17] This '*greenium*' has generally been marginal -- a few basis points out of a hundred on average in investment grade bonds. For astute investors, whether sustainable or agnostic, this potential mispricing can even present a source of alpha.

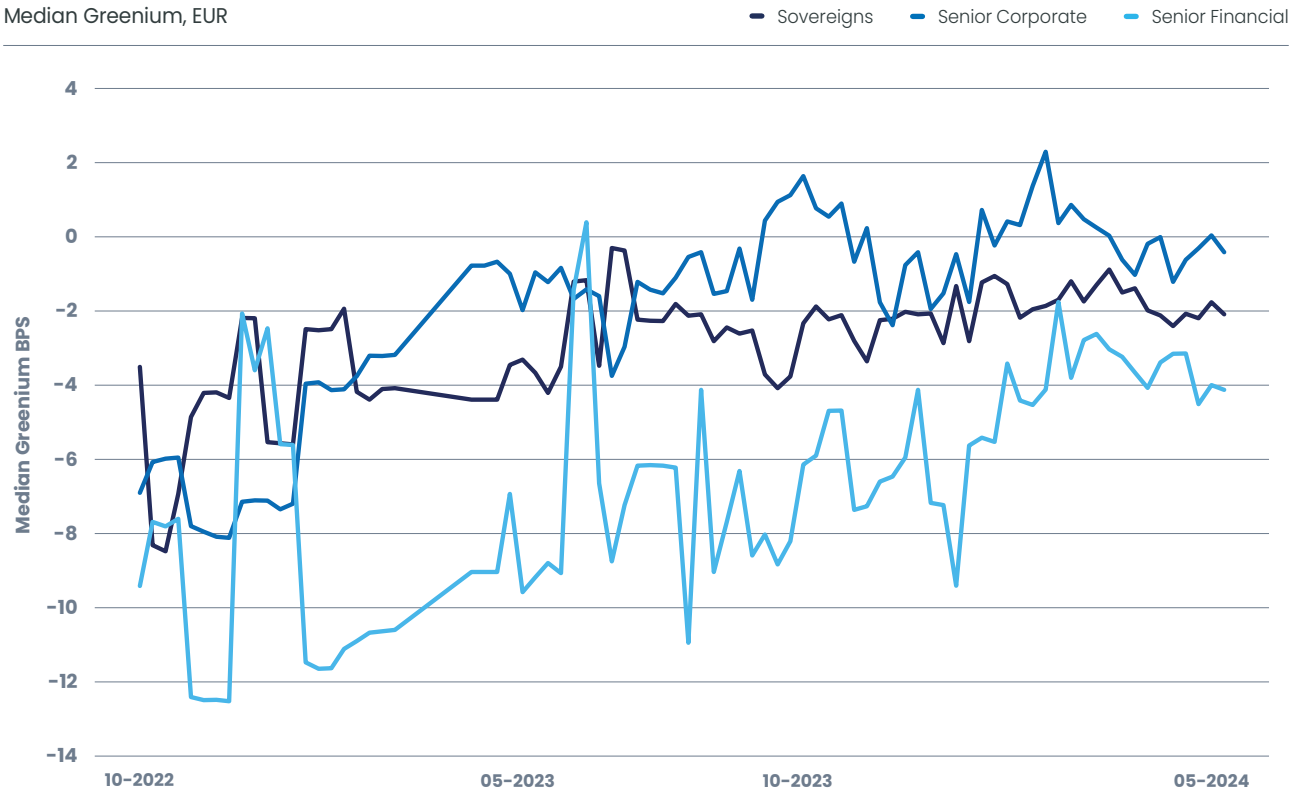
What have we seen?

Given the importance of not overpaying for the ESG features of green bonds, can we determine the greenium over time, and by segment? We have developed our own models to follow the evolution of that greenium by the market segments such as IG senior corporates, IG senior financials, sovereigns, HY, etc.

The case is simple. Given their tendency to revert to a zero greenium, the market seems to see little sense for green bond prices to differ much from those of comparable non-green bonds. When this does occur, only is the result of imbalances at bond level, but given the incentive for issuers to come with more of that format, the imbalance when extreme does not last too long.

Measuring this level of green bond pricing is key to generating alpha as it makes sure investors do not overpay for a green bond versus the whole green bond market and even at the global market it can help to optimize the allocation towards green bonds (invest more when the mispricing is reduced).

Figure 4:
Median Greenium, EUR



The scenarios and data presented are an estimate based on evidence from the past, and/or current market conditions and are not an exact indicator.
Source: Candriam.

Cases in credit analysis: ESG analysis must always be accompanied by fundamental credit analysis

Ørsted A/S
Twists in the road to green

Once a darling of the bond market, and a prime example of an oil & gas company successfully transitioning to renewable energy, Ørsted's bond valuations deteriorated in 2023. Agencies subsequently downgraded their outlooks and in early 2024, the senior debt was downgraded by S&P to BBB and the Hybrid debt to High Yield. Between July and October of 2023, there was a 50 basis point widening for some senior bonds, and 6 points from the par on some hybrid issues.[18]

Higher interest rates have has significant impact on the renewable energy sector. Substantial upfront capital investments, aggressive expansion plans, supply chain disruptions, and entry into the nascent US market with its tax credit uncertainties and requirements for local production all reminded investors of the operating and financial leverage in this sector.

Ørsted seems to be navigating the issues after cutting jobs and withdrawing from certain offshore wind markets. European peers continue to review their strategies. *However ambitious the ESG profile, the credit fundamentals must be followed.*

Commercial Real Estate:
Can green credentials help predict vacancy?

The commercial real estate (CRE) sector is grappling with several challenges, notably rising vacancy rates as office demand suffers from the rise of the work-from-home trend. Adding to the CRE sector's woes is the rise in interest rates.

The environmental performance of buildings receives a smaller share of the conversation. Buildings account for 40% of energy consumption in Europe. Most are over 50 years old, with 75% lacking energy efficiency. A mere 1% undergo energy renovations each year.[19]

The 'green' credentials of buildings has emerged as a significant, albeit sometimes overlooked, factor in the CRE market. The need to increase scrutiny on environmental performance have created further market polarization. Regulatory pressure is also mounting. In the long run, properties with poor energy ratings will face higher operating, insurance, and maintenance costs. More importantly, buildings that do not meet future market expectations – whether regulatory requirements, or operating costs -- are likely to experience weaker demand, higher vacancy rates, lower rental growth, and could ultimately become 'stranded assets.'

As interest rates decline or stabilize, the CRE sector may experience some relief, but investors will increasingly need to incorporate ESG analysis -- a hidden but critical factor in occupancy and financial viability.

Timing the Electric Vehicle transition : Will the tortoise or the hare win the ESG race?

Carbon neutral transportation may score well as an ESG opportunity but given the transformation necessary in the business model , it is not without risks. The adoption of electric vehicles (EVs) presents several challenges for the credit market, exacerbated by an uncertain context and external threats. Historians and car fans may recall the Ford Edsel, a 1950s car which supposedly failed by being *ahead* of the market.

The credit risk applies beyond manufacturers, for example risks to companies which made significant investment in electrifying their fleets. Try predicting the course of these trends:

- **Subsidies**: Government support including tax is complex, controversial (US), and declining (Germany). While mostly a reduction in aid, even with some increases in support consumer inability to plan dampens enthusiasm.
- **Stagnation in consumer purchase intentions**: Despite increased awareness of environmental issues, concerns about charging infrastructure, battery range, and purchase cost remain major obstacles.
- **Policy unpredictability**: Political uncertainty, for example the new parliament resulting from the last European elections, adds to this complexity by making policies difficult to predict. Consumers need predictability to plan their purchases, and capital-intensive manufacturers need long lead times. Could the European elections result in a reconsideration of the 2035 ban on sales of internal combustion engine vehicles?
- **Competition from China**. Benefiting from lower production costs and strong innovation capabilities, this competitive pressure could reduce market share and margins for European manufacturers.

Could manufacturers who went all-in on total electrification become an Edsel, but without the benefit of Ford? Companies that have not established a place in hybrids, could be particularly vulnerable. In the face of these challenges, flexibility and diversification are essential to creditworthiness.

Hertz rental suffered significant losses after investing heavily in electric vehicles, illustrating the risks associated with timing the transition. The Tesla price cut on new cars slashed the value of Hertz's assets. This experience demonstrates the importance of maintaining some flexibility in investment strategies.

BMW's more hybrid approach of building multiple powertrains on the same assembly line -- diesel, gas, hybrids, and full electric -- provided maximum flexibility. Initially questioned by some ESG-savvy investors because of the higher combined investment, BMW's ability to adjust to the unpredictable pace of the transition looks smart today.

Sustainable strategy performance: Structural costs?

Sustainable investments inherently restrict the investment universe, typically reducing the available universe by 10% to 40%,[20] (depending on the investment strategy, the requirements of national labels, and an array of elements). These hard exclusions, along with KPI targets, form the core of the extra-financial performance of the Sustainable strategies.

The usual concern is that the constrained nature of sustainable strategies may reduce (though not eliminate) some of the financial alpha capabilities of sustainable strategies, when compared to unconstrained ones. For the theoreticians among you, according to Black and Litterman's Fundamental Law of Active Management, alpha generation capacity is dependent on 'Breadth' i.e. the capacity of a strategy to establish independent positions[21]. The smaller your investable universe, the smaller the independent opportunities for the alpha investment manager.

By addressing the asymmetric risk of credit, ESG is also intended to improve the risk-adjusted performance. But, in theory, as ESG integration becomes widespread, that source of value is not the prerogative of the sustainable strategy.

For instance, an unconstrained investor who considers ESG or other extra-financial factors might avoid investing in a coal issuer due to an unrewarding ESG premium, but might opportunistically participate in a primary deal for the same issuer if significant mispricing and 'new issue premium' were to be (temporarily) available.

While unconstrained strategies can also benefit from ESG integration, the sustainable ones might be expected to lose the flexibility and freedom of an unconstrained universe.

Acknowledging that leads us to the fundamental question: Can sustainable IG Credit strategies create alpha against an agnostic, non-ESG benchmark?

Long-term expected returns

What difference might there be in the long-term expected return between the Candriam sustainable universe and the agnostic universe, without any active input ?

ESG ratings are generally correlated with credit quality, for both good and bad reasons. Intuitively, credit quality tends to increase with the size and sophistication of companies, especially among the lowest-rated firms. A good ESG ranking generally begins with transparency of data and intentions. Furthermore, some extra-financial information is already incorporated into credit ratings

There are less positive reasons for this correlation. An overreliance on systematic ESG data collection and a lack of qualitative assessment in the investment industry may have reinforced the correlation between credit quality and scores from commercial ESG data providers. At Candriam, our ESG framework requires analytical inputs which are beyond data systematization, and are designed to spot sustainable flags even when they are small.

Perhaps because our ESG methodology is forward-looking, perhaps because it includes a scoring with judgemental inputs weighted by their relevance to each sector, the Candriam sustainable credit universe is virtually uncorrelated with credit quality. Specifically, for Euro IG senior corporate bonds (ex financials and subordinates), the correlation between our ESG rating scores and the median rating credit quality[22] is indistinguishable from 0. Using the same universe, the correlation with the MSCI ESG rating is negative, at -0.17.

We can put figures to the differences in expected returns. The weighted average spread difference between our Sustainable universe and the overall IG market is close to 0 (roughly -2 bps) for similar duration.[23] **This means that in the long-run (eg, held to maturity) and assuming same downgrade or default between both universes, there is no reason for the Sustainable universe to underperform the wider iBoxx benchmark.**

Factor analysis and the 'Carbon Premium'

Given the volatility and drawdown history of ESG funds, they are reasons to think that some of any 'ESG premium' might instead actually be systematic risk factors. For example, the 'carbon premium', or the extra return the market demands for bonds of firms with high emissions.

When we analyse the spreads of the senior corporate bonds in the IG investment universe, factoring in the carbon footprint (Scope 1 and Scope 2) of issuers, we find a statistically significant relationship between spreads and carbon footprint as of June 2024[24]. Although very small on average -- 1bps spread for a carbon footprint of 285 tCO2e per million euros invested -- there are more than ten companies in the universe with footprints above 1300 tCO_2e![25]

This 'carbon premium' likely overlaps with other non-ESG premiums, before example a 'cyclical premium' -- the industries that are the most exposed to the economic cycle often have higher inherently higher carbon footprints.

Carbon footprint is a reliable proxy for transition risk. Transition risks include the impact of decarbonization objectives set by major European credit investors (such as the ECB and financial institutions committed to net-zero). For example, we have observed that some buy-and-hold institutional investors with intermediate decarbonization targets (such as the 'intermediate' 2030) can no longer bear the credit portfolio carbon footprint of heavy emitters, particularly for long-term maturities.

So is the carbon premium purely an ESG preference, or does it reflect a broader systemic risk factor which may be sensitive to changes in broad market evaluations of carbon emissions and regulatory changes? Extrapolating the carbon risk example, the modest Sustainable spread difference (lower expected return) mentioned earlier could actually be the result of a reduced exposure to some systematic risk.

ESG sector bias in credit

Even the best efforts to remove biases when creating a sustainable universe leave some residual risk exposure differences versus an agnostic benchmark. Sector exclusions are becoming indisputable in a Sustainable universe, and as we discussed earlier are the current direction of the market. For example, our Best in Universe sustainable framework, create (and takes on) some sector bias relative to the iBoxx Euro Corp.

How does this affect risk-adjusted credit returns, and how does credit compare to equities? To gain some understanding, we compare sector's weekly sector correlations within Euro Equities with those found in Euro IG Credit over the last 10 years.

Specific to Euro IG Corporates, we examined (sector share price correlations within the Eurostoxx 600 equity, and sector spread correlations within the iBoxx Eur corporate bonds. The differences between equity bond markets were stark.

In credit, sector exclusion creates less bias, as measured by tracking error, than for equity. (This holds despite the duration factor, which is ESG-agnostic.)

Figure 5:
Sector Correlations Equity vs Bonds
Eurostoxx 600 and iBoxx Euro-Aggregate: Corporates

	Equities	Credit (Prices)	Credit (Spreads)
Index	1.00	1.00	1.00
Basic Industry	0.69	0.92	0.91
Industry	0.94	0.97	0.95
Chemicals	0.90	0.96	0.93
Food and Beverage	0.77	0.96	0.95
Consumer Products	0.86	095	0.92
Banks	0.75	0.95	0.89
Health Care	0.74	0.95	0.85
Real Estate	0.76	0.92	0.82
Energy	0.72	0.96	0.93

Source: Bloomberg, Candriam

Conclusion: Sustainable *performance*?

Sustainable strategies are key to producing extra-financial performance. Increasing transparency, especially in the EU, increasingly allows us to measure the extent to which this holds. This includes the growing offerings of instruments *specific to fixed income*[26] (such as green, social, and sustainable bonds)

Sustainable money is a key part of the future of financial markets. Our society, and therefore our economy and financial markets, face major challenges including climate change, aging populations, resource scarcity, food security, water availability, and more. Financial markets are a key part of funding the solutions.

Because *sustainable money* is, and will be, key to these societal issues which threaten our economy, it is important to maximize its risk-adjusted performance. How does this apply to managing a sustainable IG portfolio?

- Investors should incorporate extra-financial factors, including ESG factors, as a valid tool in avoiding credit accidents (indeed, to financial performance, we believe that managers incorporate these factors).
- Managers should understand and monitor the evolution of ESG premia and technicals.
- Asset managers must apply a robust and ongoing fundamental analysis, integrating ESG at the issuer level.
- Portfolio managers should adapt all their sophisticated tools as markets evolve, such as optimizing allocation and trading activity within the Sustainable universe.

We believe that sustainable strategies in Euro investment grade credit can both offer societal benefits, and enhance financial performance.

We are happy to be judged on both.

Main risks of the Sustainable Euro IG strategy.

- **Risk of capital loss:**

There is no guarantee for investors relating to the capital invested in the strategy in question, and investors may not receive back the full amount invested.

- **ESG Investment Risk:**

The non-financial objectives presented in this document are based upon the realization of assumptions made by Candriam. These assumptions are made according to Candriam's ESG rating models, the implementation of which necessitates access to various quantitative as well as qualitative data, depending on the sector and the exact activities of a given company. The availability, the quality and the reliability of these data can vary, and therefore can affect Candriam's ESG ratings. For more information on ESG investment risk, please refer to the regulatory documents.

- **Interest rate risk:**

A change in interest rates, resulting in particular from inflation, may cause a risk of losses and reduce the performance of the strategy (especially in the event of a rate increase if the strategy has a positive rate sensitivity and in the event of a rate reduction if the strategy has a negative rate sensitivity). Long term bonds (and related derivatives) are more sensitive to interest rate variations. A change in inflation, in other words a general rise or fall in the cost of living, is one of the factors potentially affecting interest rates and consequently the NAV.

- **Credit risk:**

Risk that an issuer or a counterparty will default. This risk includes the risk of changes in credit spreads and default risk. Some strategies may be exposed to the credit market and/or specific issuers in particular whose prices will change based on the expectations of the market as regards their ability to repay their debt. These strategies may also be exposed to the risk that a selected issuer will default, i.e. will be unable to honour its debt repayment, in the form of coupons and/or principal. Depending on whether the strategy is positively or negatively positioned on the credit market and/or some issuers in particular, an upward or downward movement respectively of the credit spreads, or a default, may negatively impact the performance. When evaluating the credit risk of a financial instrument, the Management Company will never rely solely on external ratings. The risks listed are not exhaustive, and further details on risks are available in regulatory documents.

Find out more about risk profiles:
www.candriam.com

Appendix: The Candriam sustainable universe.

The Candriam analytical foundation

Based on our belief that good portfolio management requires good risk management (in all asset classes), we analyse each issuer and each issue before including it in any portfolio. For all portfolios, this includes some integration of ESG factors. For Sustainable portfolios, the process involves additional depth.

Candriam utilizes a structured ESG research and integration process to assess these probabilities. Our combination of both positive and negative analyses always us to identify growth opportunities which can enhance cash flow, and risks which might impair future creditworthiness or even strand assets.

The state-of-the-art in finance has come a long way since Candriam first established our in-house ESG Research Team in 2005.[27] As we and many other investors work continuously to improve availability and transparency of investment-relevant extra-financial information, we continue to expand our ESG analysis to all asset classes and to refine. We continuously enhance our analytical approach for improved transparency, client needs, and regulator changes.

Candriam utilizes a structured ESG research and integration process to assess these risks and opportunities. It is increasingly possible to apply a similar approach whether considering equities, bonds, or other securities. Today, our process consists of four pillars:

Our **Norms-based analysis** evaluates compliance of issuers, especially corporates, with international norms and standards. We exclude issuers that have significantly and repeatedly breached any of the ten principles of the United Nations Global Compact or the OECD Guidelines for multinational enterprises. Our analysis includes Human Rights, Labour Rights, Environment, and Corruption, and we consider four factors:

- **Temporal**: When did the incident occur, and how long did it last?
- **Magnitude**: What was the damage and the related costs?
- **Credibility**: What were the allegations, legal proceedings, or other issues?
- **Recurrence**: Was this a one-time event, or were there repeated instance?

Our **Controversial Activities Analysis** excludes companies whose activities carry significant sustainability-related risks and cannot be reconciled with sustainability objectives. Our rationale for each type of exclusion, which is updated and refined as data availability and markets evolve, is detailed in our Candriam Exclusion Policy.

Our **Business Activity Analysis** assesses the extent to which a company's products and services are exposed and contribute, positively or negatively, to five Key Sustainability Challenges (KSCs): *Climate Change*, *Resource Depletion*, *Demographic Shifts*, *Health & Wellness* and *Digitalization*. These long-term trends and challenges significantly influence the economic environment in which companies operate and one or more will determine the future of each company. Our analysis considers the industry in which each company operates, its geographic location, business model, and other relevant factors. Our sector expertise allows us to evaluate materiality assessments for each KSC in each business activity of a company, and conduct granular assessments of underlying business activities. We examine sensitivity of a company's revenue, cash flow, assets, capital spending, etc to the five KSCs.

Our **Stakeholder Analysis** evaluates a company's ability to sustainably incorporate stakeholder interests into its long-term strategy, and the potential positive or negative impact of company strategy on its stakeholders. These stakeholders include the Environment, Society, Employees, Suppliers, Clients and Investors. Our analysis integrates quantitative and qualitative assessments of materiality. For instance, we may look at the frequency of events such as accidents and fines; the tangible or intangible financial impact of ESG issues, the degree of attention paid to shareholders and investors, and the outlook and prospects for a company to improve or deteriorate.

*** Over time, we expect that the European SFDR classifications will provide more internationally-harmonized definitions, but for the moment, classification is subject to the interpretation of each asset manager.*

More detail is available in our Transparency Codes.

Notes & References.

1 Under Article 9 of the European Union SFDR, or Sustainable Finance Disclosures Regulation, these portfolios have distinct sustainability objectives.

2 Source: iBoxx. 35.1% applies to Banks and Insurance cos, but excludes real estate. As of June, 2024.

3 Based on the iBoxx EUR Corporates (Total Return), frequently used to define European IG Corporate Credit. In this document, 'benchmark' will refer to iBoxx EUR Corporate (Total Return) unless otherwise specified. All data related to the benchmark is as of June, 2024.

4 Source: Trucost and Candriam, EPA.

5 Candriam, Bloomberg.

6 World Economic Forum, in partnership with March McLennan and Zurick Insurance Group. The Global Risks Report, January 2024. https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2024.pdf (weforum.org), Accessed 20 June, 2024.

7 Source: IATA

8 Bloomberg, 5 June, 2024. Banks Told to Brace for ECB Fines After Mismanaging Climate Risk, https://www.bloomberg.com/news/articles/2024-06-05/banks-told-to-brace-for-ecb-fines-after-mismanaging-climate-risk, accessed 1 July, 2024.

9 June, 2024.

10 Trucost, 24 June 202. The iBoxx reports emissions relative to enterprise value, so we report our portfolio carbon footprint the same way for comparability.

11 Technical subtleties include the business model of the bank, as the ratio only relevant to financing, and the geography, as the ratio is only relevant with the EU taxonomy.

12 Since 2021, the ECB has been able to include these bonds in its purchasing program(s) for green bonds.

13 Indeed, insufficiently clear or ambitious targets are a primary consideration for Candriam proxy voting on all topics. https://www.candriam.com/siteassets/medias/publications/brochure/commercial-brochures/sri-brochure/voting-and-engagement-report-2023.pdf

14 Dollar bond maturing 9 Oct 2024.

15 Sources: Candriam, Bloomberg.

16 Company reports and Candriam estimates.

17 Ben Sliman, M., Da Fonseca, D., and Mahtani, V. (2020). *Facts and Fantasies about the Green Bond Premium*. See ResearchGate, 348650560. Accessed 1 July, 2020.

18 Candriam, Bloomberg.

19 Source: European Commission, accessed 9 July, 2024. Commission welcomes political agreement on new rules to boost energy performance of buildings across the EU. https://ec.europa.eu/commission/presscorner/detail/en/IP_23_6423

20 Source: ISR label, peers flagships, European Securities and Markets Authority final guidelines on fund names.

21 (α=IC×BR×TC×$\sigma\alpha$), Black and Litterman (1992), based on Grinold, Markowitz and Sharpe. Financial Analysts Journal, 48(4), 28-43. Accessed 1 July, 2024.
With α defined as the excess return over the benchmark, IC is the Information Coefficient that measures the correlation between the manager's forecasts and the actual outcomes, BR (breadth) is the number of independent investment decisions, TC is the Transfer Coefficient, or efficiency with which the manager's skill is translated into active positions and $\sigma\alpha$ is the standard deviation of alpha, which represents the risk or volatility associated with the excess returns.

22 Methodology: we assign a quantitative credit rating by a linear score conversion of Credit rating agencies (from respectively 1 to 16 and AAA from B-) and do the average of the available 3 main rating agencies (S&P, Moody's and Fitch)

23 Candriam, Bloomberg.

24 Candriam, Bloomberg.

25 Candriam, Bloomerg, Trucost.

26 Equity is issued once. It is difficult to change (articles of incorporation, etc) and increases in equity value do not generate new cash to the firm. New issuances of equity are rare. Bonds mature and New bonds finance growth. New bonds can be issued in new formats.

27 The following year, 2006, Candriam became a founding signatory of the UN PRI.

€145 B

AUM at end December 2023*

+600

Experienced and committed professionals

+ 25 years

Leading the way in sustainable investing

*As of 31/12/2022, Candriam changed the Assets Under Management (AUM) calculation methodology, and AUM now includes certain assets, such as non-discretionary AUM, external fund selection, overlay services, including ESG screening services, [advisory consulting] services, white labeling services, and model portfolio delivery services that do not qualify as Regulatory Assets Under Management, as defined in the SEC's Form ADV. AUM is reported in USD. AUM not denominated in USD is converted at the spot rate as of 31/12/2023.

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