Group Economics | Financial Markets & Sustainability Research | 11 December 2023
Marketing Communication

SustainaWeekly

A more gloomy outlook for EU spending towards climate next year

- **ESG Bonds: European governments have been increasing over the years their climate ambitions, but this requires a great amount of investment funds. However, at the same time, the fiscal policy is now turning in Europe and EU countries are pressured to reduce deficits and debt levels for the coming years. Also a political landscape more skewed to far-right will make it harder for green investments to increase.**

- **Strategist: When bank bond issuers face ESG risks such as climate change, this should be translated in the market through significant pick-up on longer maturities. Based on that, we use the ValueCo ESG opinions to assess where banks stand with regards to such risks. Our analysis indeed reveals a relation between such opinions and the steepness in the curve, but that relationship is more clear when we purely focus on the environmental part of such opinion.**

- **Sectors: We have done a trilogy on CCS. Our first publication was on the technologies and techniques to capture carbon (see here). Then we focussed on how to transport CO2 (see here). In this SustainaWeekly the central question is how to store CO2? We answer what kind of state CO2 needs to be in order to store it. But also in what geological sinks CO2 can be stored and what trapping mechanisms are used. In the future we will also focus on CO2 utilization, direct carbon capture and mobile carbon capture.**

- **ESG in figures: In a regular section of our weekly, we present a chart book on some of the key indicators for ESG financing and the energy transition.**

The political landscape is changing in Europe. Political discussions have now turned to fiscal tightening, which signals lower government spending in the coming years and thus, likely to impact green investments in turn. At the same time, the recent and future upcoming political elections do not point towards positive development in this field. We therefore expect ESG EU sovereign bond supply to stall in the coming years, as we discuss in our first piece. We then move on to assess how ESG opinions are affecting the shape of bank spread curves in the senior non-preferred space**.** Lastly, we continue with our series of deep dives into carbon capture and storage by focusing now on how to store the captured CO2. This is the last SustainaWeekly of this year. We would like to wish you great days ahead and a happy New Year.

Enjoy the read and, as always, let us know if you have any feedback!

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ESG sovereign bond supply to stall in the coming year

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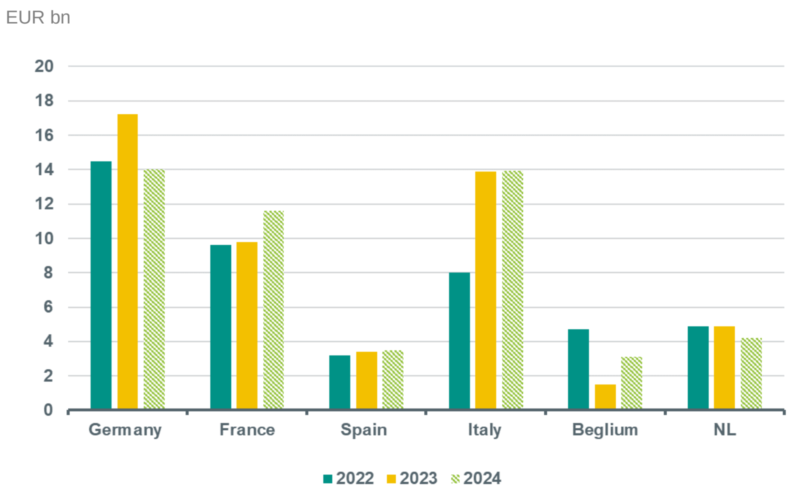
- **Following three years of unprecedented sovereign bond supply, ESG bond issuance also benefited from this trend in the past years**
- **However, the fiscal policy is now turning in Europe and EU countries are now pressured to reduce deficits and debt levels for the coming years**
- **This clearly contrast with the urge of governments to spend more on climate and energy transition**
- **Furthermore, the political landscape in Europe is now further skewed to the far-right parties which do not aim to increase but rather decrease spending in green investments**
- **Current negotiation on the new EU fiscal rule is our last hope to see a boost in green investments in Europe**
- **The NGEU green bond supply is also stalling and is far from meeting its yearly issuance target**

Over the past three years, we have seen ESG government bond supply develop and increase its size in the sovereign debt market with its issuance portion to reach as high as 10% in the Dutch debt market for instance. As we expect a similar gross supply outlook in 2024 than 2023 (see here), ESG bond issuance should also amount to a similar levels than this year for most EGBs. However, the risk points to the downside, particularly from 2024 onward, as the political will and fiscal capacity of most European governments tend to signal a stabilization and even a decrease in green investments. And thus potentially lower ESG bond supply going forward.

The end of fiscal stimulus in Europe is likely to affect ESG bond supply in the coming years…

Despite increasing investment needs for the climate transition, the European governments still struggle to make space in their budget to increase green investments. The most recent example is in Germany where the German Constitutional Court has rejected the reallocation of EUR 60bn from the Covid plan unspent to a Climate fund, ultimately impacting its funding plan for the years to come. This EUR 60bn immediate cancellation has a significant impact on Germany's Climate and Transformation (KTF) fund which previously planned to spend more than EUR 177bn over the next three years to speed up the country's industrial modernization and green energy transition. The Court judged that the unused debt cannot be transferred into an off-budget fund for initiatives like climate investments. This is an ironic situation, given that Germany was blamed for not putting enough financial effort into their Climate agenda, given the size of its economy. Indeed, the Climate Council warned earlier this year that Germany must increase its efforts and not push off the responsibility to Europe. However, this is more difficult to put into practice. The rest of the Eurozone will also have difficulty in expanding their budget further.

ESG bond supply to remain stable in 2024



Source: Bloomberg, ABN AMRO Group Economics

Despite the rise in green bond supply over the past years, this is still a niche market in the sovereign debt area. On average, it represents between 3% to 5% of EGB debt issuance. Looking at the big-6, the ESG bond issuance amounted to almost EUR 50bn in 2023, slightly higher than in 2022 (see chart above). We expect a similar amount next year but with risk to the downside particularly due to the uncertainty over the German budget for 2024, which could lower borrowing requirement further.

This year marks the end of the fiscal stimulus by European governments. The EU has put pressure for European countries to restore fiscal stability and reduce debt levels starting next year. As such, the political discussions have now turned to fiscal tightening. This signals lower government spending in the coming years and thus, likely to impact green investments in turn. Unless government spending for the Climate is to be recorded as an ''off-budget'' (as German government attempted to do and failed) and exempt from the debt safeguards, we expect aggregated green bond supply to stall and potentially even decrease in the coming years. In addition, the significant rise in borrowing costs over the past two years also made investments less affordable and now puts another important financial constraint on European governments - which is interest payments. For highly indebted countries like France, interest costs will indeed become one of the top 3 government expenses next year and we estimate interest costs to be as high as EUR 70bn by 2025 (which would represent the biggest government expenses item). Despite an increasing share on the French government budget allocated to Climate, the government spending remains lower with EUR 40bn allocated in 2022. This is unlikely to increase much further as the government now even get lesser fiscal space to do so.

In the end, there is pressure for European governments to reduce their government spending while increasing green investments significantly over the coming years. Which of those two will prevail is the real question and the answer to it will set the trend for ESG bond issuance going forward.

… as well as the political landscape

Political elections can also significantly affect the climate mitigation progress. Next year represents an important driver on the direction that national climate policy will take for the coming years. The way countries develop determines their capacity to push forward their climate agenda and achieve other sustainable development objectives simultaneously, as highlighted by climate experts in the **IPPC**. Unfortunately, the recent and future upcoming political elections do not point towards positive development in this field. Indeed, the recent election in the Netherlands serves as a good example where a climate sceptic party (PVV) has completely turned around the political landscape and has in the meantime put at risk the current climate policy of the country. As discussed in our **global outlook**, the risk is for a delayed transition if a right-wing coalition led by Geert Wilders is to take place. Indeed, Geert Wilders, who is the leader of the PVV party, is known for his climate skepticism and the desire to cut spending on renewable energy. Therefore, green investments will likely stagnate and even decrease under this coalition.

Turning into a European picture, the EU election to be held in June 2024 also points to a progress of far-right political parties in the EU parliament, which increases concerns around the future EU climate policy. Given that some far-right parties are opposed to spending on green investments, this could indeed add an additional delay on national climate policies and the implementation of the EU green deal. A topic we also discuss in more details in our global outlook. In our view and based on current polls, it is unlikely that the EU Green deal will be changed or abandoned. However, the most likely scenarios tend to point to a rather weaker climate stand within the EU and thus the risk of becoming less proactive in a critical decade for limiting the impacts of climate change.

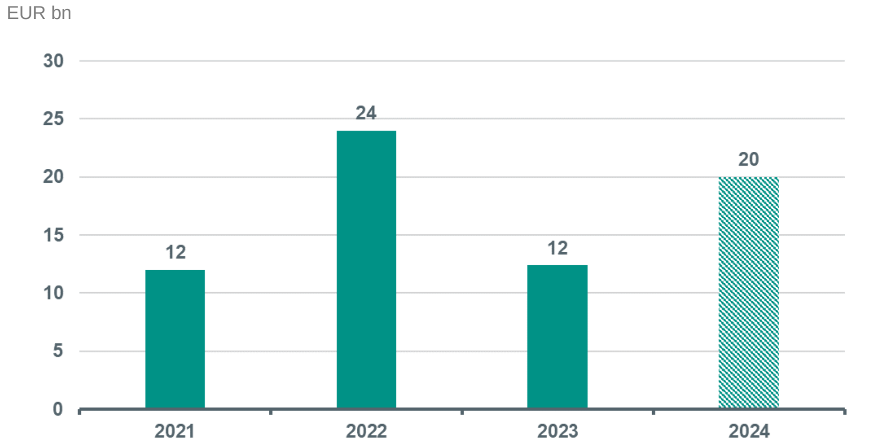
However, there is one positive among this gloomy green outlook: it is the new EU fiscal rule currently in negotiation. The EU finance ministers are currently looking at Spain's proposal, who holds the EU presidency, where the aim is for governments to rein deficits and debt while leaving room for green and defense investment. A potential agreement on a new EU fiscal rule could indeed give a boost to green investments in Europe.

The EU also falls behind its NGEU green bond issuance target

Following the pandemic, the EU launched the NextGenerationEU (NGEU) program to support Europe's recovery with a total envelope of EUR 800bn to be issued between 2021 and 2026. From this, the EU targeted to finance 30% of this program via green issuance. As a result, the size of the borrowing is expected to be around EUR 180bn per year, which translates into an NGEU green bond issuance of EUR 45bn per year. However, this is far from the current and previous EU green bond issuances, as shown in the graph below. So far, the EU raised almost EUR 50bn in green bond format, which remains below European governments like Germany with an amount outstanding at EUR 55bn, albeit the growth trend progressing much faster than in any European governments. The uncertainty remains on whether this trend will persist in the future.

In 2022, the EU issued about EUR 24bn of green bonds, which was higher than Germany and France's green issuance combined. However, given the lower than expected EU issuance this year, the green bond supply dropped in 2023 with only a total of EUR 12.4bn raised. Again, very far from the EUR 45bn yearly issuance if the EU were to meet the 30% target.
If the EU were to continue with the EUR 800bn envelope announced at its launch (which seems unlikely), this would mean that more green bonds will be printed between 2024 and 2026. However, this is not our view, given the EU disbursements delay and based on what EU member states currently requested from the recovery facility (RRF). Therefore, we expect EU green bond issuance to be lower than previously expected.

EU green bond supply still far from meeting its 30% target



Source: EC, ABN AMRO Group Economics

ESG opinions are affecting the shape of bank spread curves

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- **The market should reflect on significant pick-up on longer maturities when bank bond issuers face ESG risks such as climate change**
- **We use the ValueCo E opinion, as this reflects the consensus of the buyside on where the bank stands with regards to such risks**
- **Our small sample indeed reveals a relation between such opinions and the steepness in the curve when we purely focus on the environmental part of such opinion**

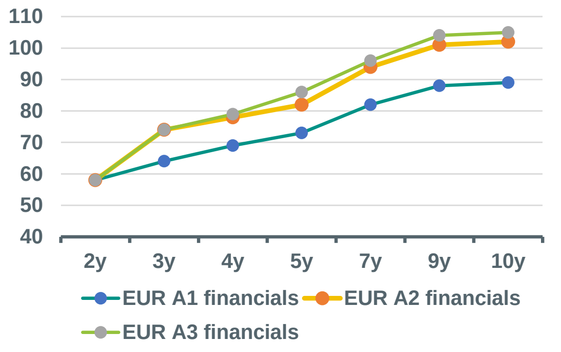
A while ago we released an introduction note related to our new research partnership with ValueCo, a data provider which specializes in collection ESG opinions from the buy-side and standardizing these. In this note (see **here**), we, amongst others, showed the statistical relevance of the ValueCo ESG consensus opinion on broad market credit spreads. But could such relevance also be visible in the relationship between short maturity bond spreads and long maturity bond spreads? This relationship is also known as curve steepness.

The economic thought behind higher steepness on weakly positioned issuers is that transition or adaptation requirements will have low importance in the short-term investment horizon, for example because governments are still in the process of deciding how the desired energy transition to meet climate ambitions is set to take shape. As such, a debt holder can be comfortable that the effects on issuers in the short maturities from for example climate change could be limited. However, such long decision making process by governments is likely to make transition and adaptation back-ended with accordingly more pressure to reduce energy intensity and emissions in a short time period. Such pressure or intensity of change is bound to drive uncertainty at investor level on longer dated instruments. Hence, one would expect that issuers with weak ESG credentials to be less prepared for this transition / adaption, and therefore the steepness in their credit curve should be higher than for issuers which benefit from stronger ESG opinions by investors.

We test this assumption by looking at the senior non-preferred (SNP) bank bond space. The issuer would be impacted when its bank loan book suffers from repayment risk because of the underlying borrowers facing high demands regarding climate policy (such as a high carbon cost eroding debt service capacity) or when the borrowers' productive assets become impaired due to expected climate change. Our bank issuer sample is limited to A2/A3 composite rated SNP / holdco senior instruments given that (1) in this seniority, we were able to draw a sufficient amount of maturities at issuers to measure steepness between short and long (i.e. close to 10y) maturities and (2) the curve for these ratings are close to perfectly aligned at the moment (see chart on the next page on the left), suggesting that we can factor out rating as a driver behind spread level and steepness. This increases our sample to 10 issuers and leaves us purely with the ESG opinion as defining factor behind the pricing and steepness, and we expect that the aforementioned risks of transition/adaption to be captured by the ValueCo issuer opinion data. We use the quantile opinion scores as this better captures differences across the financial sector. For example, two issuers can have a regular score of 60 and 65, yet if the total financial universe has scores in this range, then the first issuer will be qualified as weak and the second one as strong under the quantile approach. We use both the overall ESG opinion and the opinion focused purely on environment to find out which has a bigger effect on curves. The chart below on the right shows that many bank issuers are still perceived as environmentally friendly, and the weakness in the overall ESG score is driven mainly by low scores on governance.

Hardly a difference between A2 & A3 SNP spreads

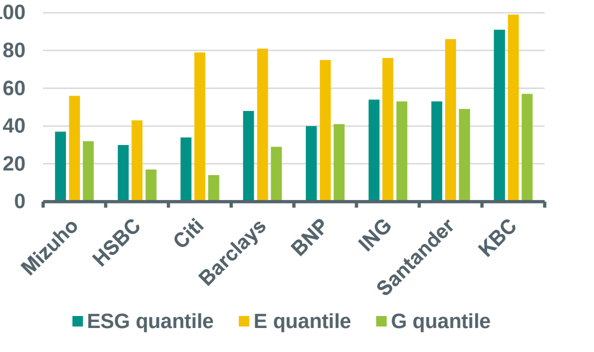
Option adjusted spread (bp)



Source: Bloomberg, ABN AMRO Group Economics

Weakness in banks ESG profile driven by governance

Quantile position %



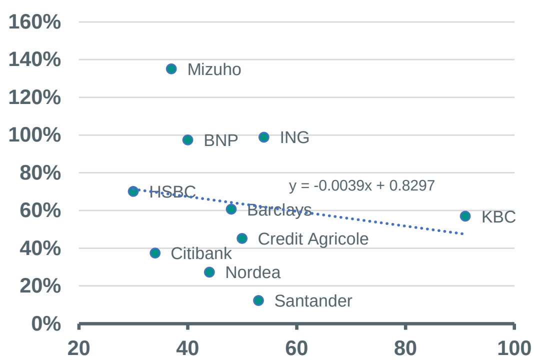
Source: ValueCo, ABN AMRO Group Economics

We expect the weaker the ValueCo (i.e. investor) opinion, the steeper the difference between our chosen maturities. To account for overall spread differences in the short maturities, we express steepness relatively, as the pick-up to the long maturity as % of the two year maturity. This avoids the wrong signal one could get from expressing de difference in absolute numbers. For example going from 10bp to 20bp between short and long maturity bond is a 10bp absolute steepness or 100% steepness when expressed relatively, while going from 20bp to 30bp is also a 10bp absolute steepness, but 50% steepness when expressed relatively.

The chart below shows the results of curve steepness when we confront these against the overall bank ESG opinion, but also purely the E opinion. Whilst a close to linear relationship can hardly be found across both examples, we do note that when we focus purely on the E-opinion, the cluster of Barclays, Citibank, Santander, Credit Agricole and Nordea in the right bottom has lower steepness. Admittedly, the BNP and ING curves should also have been flatter ideally, but the shorter maturities in ING and BNP might be priced currently at too tight spread levels given where the rest of the cluster is trading in the two year maturity. HSBC's flatness has to do with the spread on their 2y bond, being one of the widest spread levels in this sample and it would be right up there with Mizuho when in case the HSBC two year spread would be the same as Mizuho's. Finally we have also drawn a simple trend-line, but the trend-line in the E-only opinion chart drops nearly three times faster than on the overall ESG-opinion chart. This shows that the E-opinion matters more when it comes to curve steepness on bank bonds. This would also imply that bank governance issues have a bearing on both short and long-term maturities. To some extent this is indeed reflected in the higher spread on two year bonds at HSBC, Citibank and Barclays.

Issuer curve steepness and ValueCo ESG quantile

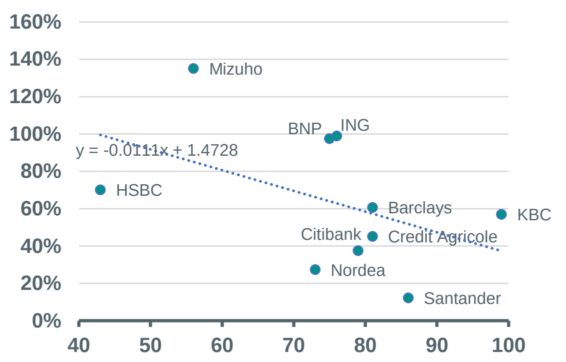
Steepness between 2y and (close to) 10y bond (bp)



Source: Bloomberg, ICE BofAML, ValueCo, ABN AMRO Group Economics, X-axis = consensus score quantile (%)

Issuer curve steepness and ValueCo E quantile

Steepness between 2y and (close to) 10y bond (bp)



Source: Bloomberg, ICE BofAML, ValueCo, ABN AMRO Group Economics, X-axis = consensus score quantile (%)

How to store CO2?

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- **Geologic or a biologic deposits can store CO2**
- **Possible geologic deposits are oil and gas reservoirs, saline formations, unmineable coal seams, organic-rich shales and basalt formations**
- **But the CO2 needs to be trapped in the deposit. There are four mechanisms to do that**
- **Costs to store CO2 are dependent on geologic characteristics; scale; and monitoring, financial, and other modelling assumptions**

Introduction

Carbon storage means to store the captured carbon in a deposit. Carbon storage is also called sequestration. There are two forms of sequestration namely biologic carbon sequestration and geologic carbon sequestration. Biologic sequestration refers to storage of atmospheric carbon in vegetation, soils, woody products and aquatic environments. Geologic carbon sequestration is the process of storing CO2 in underground geologic formations. In this note we focus on geologic carbon sequestration. CO2 can be stored underground as a supercritical fluid (see our note on **CO2 transport**). The main advantage of storing CO2 in the supercritical condition is that the required storage volume is substantially less than if the CO2 were at “standard” (room)-pressure conditions. Temperature naturally increases with depth in the Earth’s crust, as does the pressure of the fluids (brine, oil, or gas) in the formations. At depths below about 800 meters (about 2,600 feet), the natural temperature and fluid pressures are in excess of the critical point of CO2 for most places on Earth. This means that CO2 injected at this depth or deeper will remain in the supercritical condition given the temperatures and pressures present (see **here**).

Geological sinks

Sequestration technologies deposit captured CO2 in geological formations or through mineralization in reactive rocks. Geologic sequestration is a proven method of underground carbon dioxide (CO2) storage whereby CO2 is injected deep underground into deep rock formations for long-term storage. The major benefit of geological storage of CO2 is that it offers long-term isolation from the atmosphere via permanent trapping of CO2 in the reservoir’s porous medium. The cap rocks are often tight shale rocks with low permeability. One important property of a rock in the presence of two non-miscible fluids (here CO2 and formation brine or salty water) is the preference of one fluid over another to be in contact with the rock's surface, a property called wettability. Wettability directly impacts the flow of injected CO2 in the subsurface and will stay trapped in the rock. The wettability of a system controls the flow and trapping efficiency during the storage of CO2 in geological formations There are five potential geological sinks for permanent CO2 storage: active or depleted oil and gas formations (sandstones/carbonates), deep saline aquifer formations, unmineable coal seams, organic-rich shales and basalt formations.

Oil and gas reservoirs

Oil and natural gas reservoirs are ideal geologic storage sites because they have held hydrocarbons for thousands to millions of years and have conditions suitable for CO2 storage. Injecting CO2 can also enhance oil production by pushing fluids towards producing wells through a process called enhanced oil recovery (EOR). Hydrocarbon reservoirs have limited storage capacity but there is a natural trap by caprock sealing.

Saline formations

Saline formations are porous formations filled with brine, or salty water, and span large volumes deep underground. Carbon capture and storage (CCS) focuses on formations that contain brine with total dissolved solids (TDS) levels greater than 10,000 parts per million total dissolved solids. Studies show that saline formations have the largest potential volume for storing CO2 around the world.

Coal seams

Coal that is considered unmineable because of geologic, technological, and economic factors (typically too deep, too thin, or lacking the internal continuity to be economically mined) may still serve as locations to store CO2. To be considered for

CO2 storage, the ideal coal seam must have sufficient permeability and be considered unmineable. Coal seams may also contain methane (CH4), which can be produced in conjunction with CO2 injection in a process called enhanced coal bed methane (ECBM) recovery. In coal seams, the injected CO2 can be chemically trapped by being adsorbed (or adhered) to the surface of the coal while CH4 is released and produced. Adsorption is the adhesion of atoms, ions or molecules from a gas, liquid or dissolved solid to a surface. This trapping mechanism allows for permanent storage of CO2. Coal seams are often closer to emission sites but injection is extremely difficult (see **here**).

Shales

Some shales have similar properties to coal, having the ability to trap CO2 through adsorption (adherence to the surface), subsequently releasing methane and making them potentially attractive for storage. Despite their low fluid conductivity, CO2 can diffuse into and react with shale minerals and potentially migrate to fill shale pore spaces. Organic-rich shales trap a significant amount of CO2 permanently.

Basalt

Basalt is a type of formation that was deposited when large flows of lava spread from volcanoes cooled and then solidified. Over time, thick layers of basalt were built up (with other formation types often layered in between). The chemical and physical properties of these basalts, as well as the other formation types in between basalt layers, make them good candidates for CO2 storage systems. Basalt allows injected CO2 to react with magnesium and calcium in the basalt to form the stable carbonate mineral forms of calcite and dolomite. This mineralization process is promising to be a valuable tool for CCS because the mineralization process permanently locks carbon in the solid mineral structure, thereby permanently trapping the CO2 (see **here**). Injecting CO2 into porous basalt rocks has been identified as one of the most promising techniques for CO2 storage. There are three factors to take into account. The first factor is the porosity of the rock, which affects the surface area available for the CO2 to interact and be stored. Another vital factor for efficient geological storage of CO2 is the permeability of the formation, which greatly affects the injection rates. Higher permeability allows for high injection rates. The third factor is the reactivity of the rock. These rocks comprise minerals that include divalent metal cations. If the cations are unstable, the reaction will occur faster because the cations are far from the equilibrium constant. This results in faster dissolution rates in the more reactive rock and rapid mineralization (see **here**). However, there are some challenges. For a start large water consumption is required for the mineralization process. In addition basalt rock formations are heterogeneous because of their original depositional environment. Moreover, it can take thousands of years from start to finish for all the carbon to mineralize and at any point a shift in the rocks can cause some carbon to escape.

Trapping mechanism

The CO2 is securely sequestered in the deposits through four trapping mechanism (see **here**). These mechanism prevent upward migration and leakage of CO2.

1. Structural trapping
2. Residual trapping
3. Solubility trapping
4. Mineral trapping

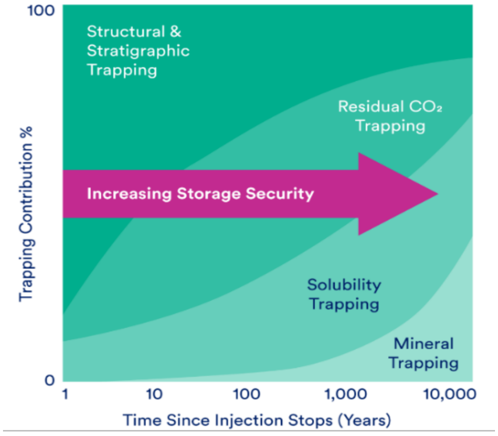
Structural trapping

Structural trapping is the physical trapping of CO2 in the rock and is the mechanism that traps the greatest amount of CO2. Structural trapping means the sealing of CO2 by a caprock. Once injected, the supercritical CO2 can be more buoyant than other liquids present in the surrounding pore space. Therefore, the CO2 will migrate upwards through the porous rocks until it reaches (and is trapped by) an impermeable layer of seal rock. Caprock is an extremely low permeable rock which prevents the flow of buoyant CO2 plume. This rock layer can be hundreds of feet thick and keeps CO_2 trapped securely. The rock layers and faults within and above the storage formation where the CO2 is injected act as seals, preventing CO2 from moving out of the storage formation.

Residual trapping

Residual trapping refers to the CO2 that remains trapped in the pore space between the rock grains as the CO2 plume migrates through the rock. The existing porous rock acts like a rigid sponge. When supercritical CO2 is injected into the formation, it displaces the existing fluid as it moves through the porous rock. As the CO2 continues to move, small portions of the CO2 can be left behind as disconnected, or residual, droplets in the pore spaces which are essentially immobile, just like water in a sponge. These reservoirs are not large. When residual trapping occurs, the CO2 is contained.

CO2 trapping mechanisms' performance



Source: IPCC, 2005

Solubility trapping

In solubility trapping a portion of the injected CO2 will dissolve into the brine water that is present in the pore spaces within the rock. The CO2 interacts with the brine water, leading to solubility trapping. At the CO2/brine water interface, some of the CO2 molecules dissolve into the brine water within the rock's pore space. Some of that dissolved CO2 then combines with available hydrogen atoms to form HCO3-. This dissolution increases the density of brines, causing them to sink even lower in the formation—reducing upward migration of CO2 (see **here**).

Mineral trapping

With mineral trapping the CO_2 interacts with minerals present in the rock formation at the molecular level via a series of geochemical reactions. These reactions result in the formation of new, solid and stable carbonate minerals. The CO_2 actually becomes part of the rock.

Storage costs

The vast majority of CO2 storage potential worldwide is in onshore and offshore saline aquifers (USGS, 2013). The cost of CO2 storage is very site dependent because the geologic characteristics vary from site to site and injection, labor, drilling, capital, and other costs vary regionally. Similar to offshore pipelines, offshore CO2 storage is generally more expensive than onshore storage. For CO2 storage in saline aquifers, various types of wells must be drilled (exploration, injection, and monitoring) which comprise a large share of the overall storage cost.

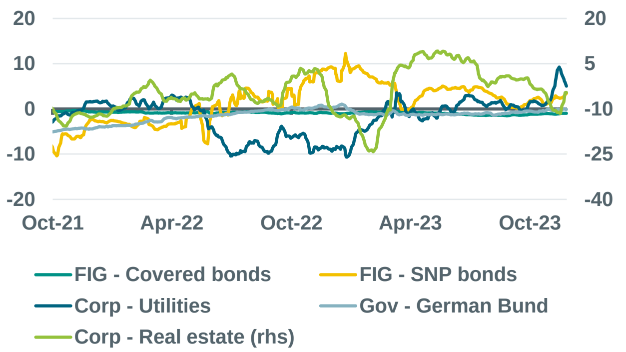
Previous studies have suggested the cost of CO2 storage in depleted oil and gas fields is lower than in saline aquifers because the oil and gas fields have already been surveyed and offer the potential to reuse existing infrastructure. However, the infrastructure need to be able to transport CO2 which has other characteristics than other gasses or liquids. So the integrity of the infrastructure needs to be verified and monitored. There are costs involved in checking the infrastructure and there are also costs involved in adjusting the infrastructure for CO2 transport. These costs

may negate any cost savings, . CO2 storage costs hinge on three major sources of variability: geologic characteristics; scale (i.e., amount of CO2 stored); and monitoring, financial, and other modelling assumptions. A handful of geologic parameters are primary determinants of whether a reservoir is favourable for CO2 storage: permeability, thickness, depth, porosity, and lateral continuity (see **here**).

ESG in figures

ABN AMRO Secondary Greenium Indicator

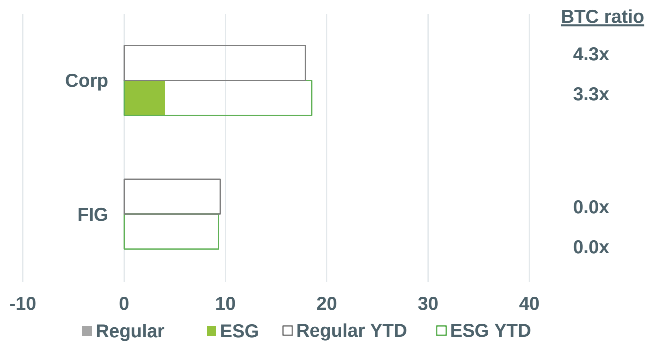
Delta (green I-spread – regular I-spread)



Note: Secondary Greenium indicator for Corp and FIG considers at least five pairs of bonds from the same issuer and same maturity year (except for Corp real estate, where only 3 pairs were identified). German Bund takes into account the 2030s and 2031s green and regular bonds. Delta refers to the 5-day moving average between green and regular I-spread. Source: Bloomberg, ABN AMRO Group Economics

ABN AMRO Weekly Primary Greenium Indicator

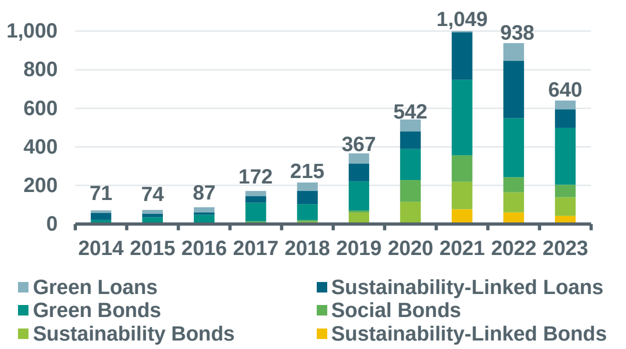
NIP in bps



Note: Data until 07-12-23. BTC = Bid-to-cover orderbook ratio. Source: Bloomberg, ABN AMRO Group Economics

Sustainable debt market overview

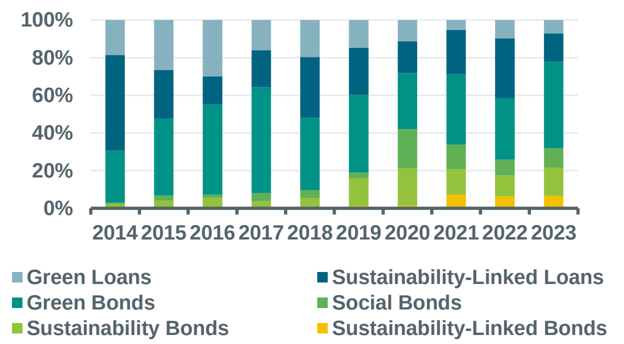
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of sustainable debt by type

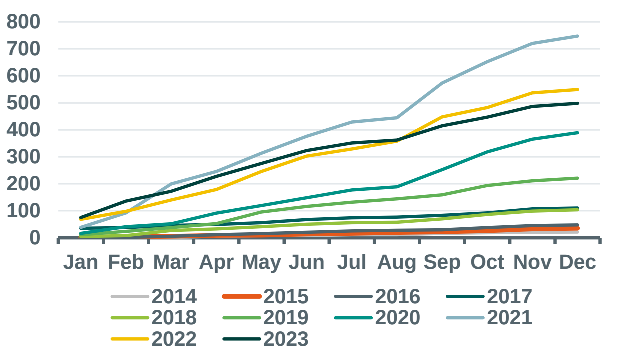
% of total



Source: Bloomberg, ABN AMRO Group Economics

YTD ESG bond issuance

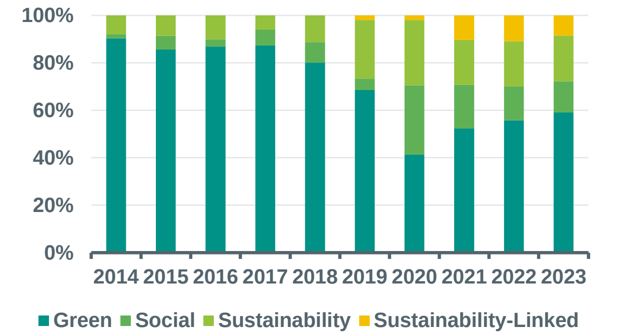
EUR bn (cumulative)



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by type

% of total

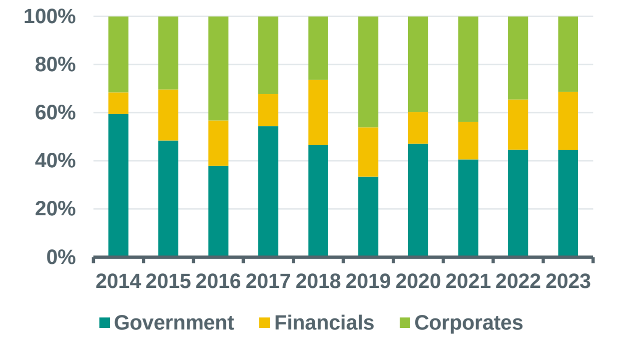


Source: Bloomberg, ABN AMRO Group Economics

Figures hereby presented take into account only issuances larger than EUR 250m and in the following currencies: EUR, USD and GBP.

Breakdown of ESG bond issuance by sector

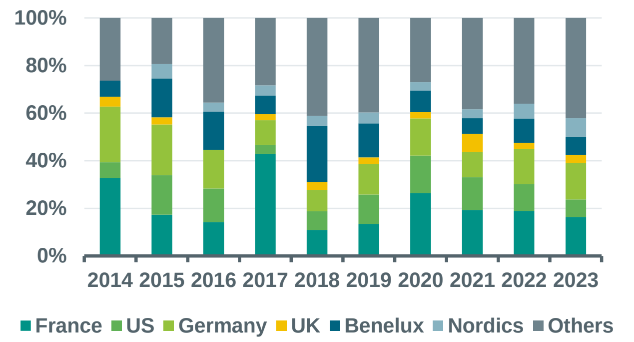
% of total



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by country

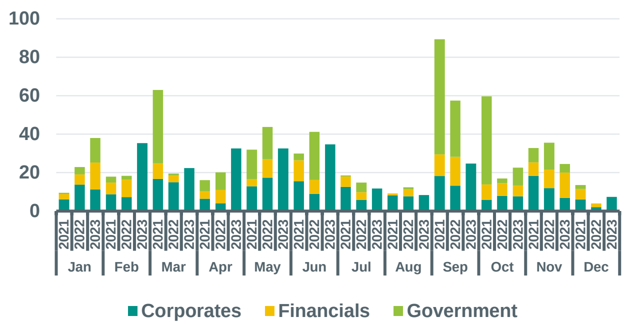
% of total



Source: Bloomberg, ABN AMRO Group Economics

Monthly Green Bonds issuance by sector

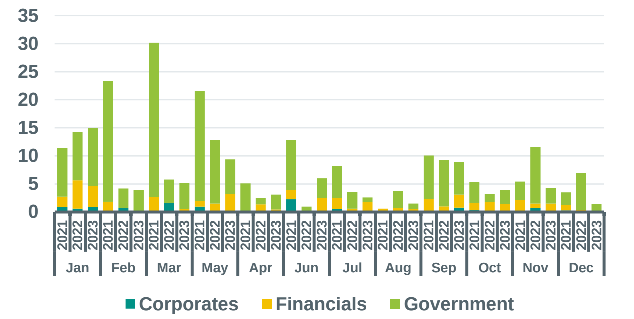
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Social Bonds issuance by sector

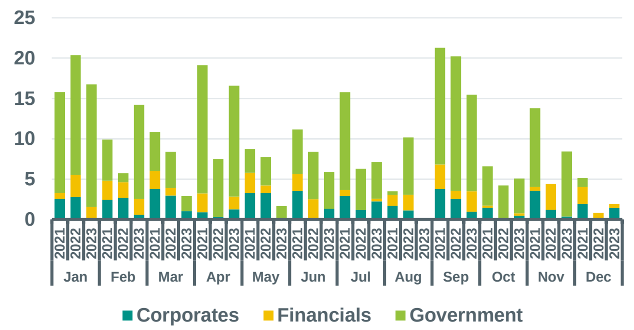
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Sustainability Bonds issuance by sector

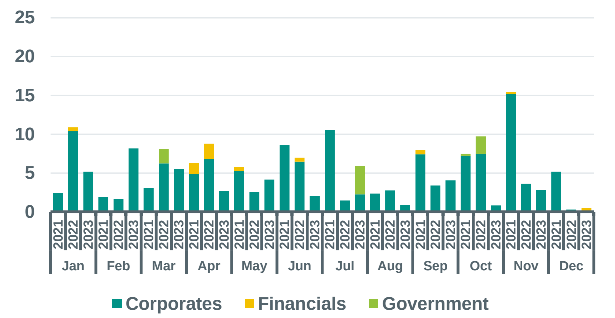
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Sust.-Linked Bonds issuance by sector

EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Figures hereby presented take into account only issuances larger than EUR 250m and in the following currencies: EUR, USD and GBP.

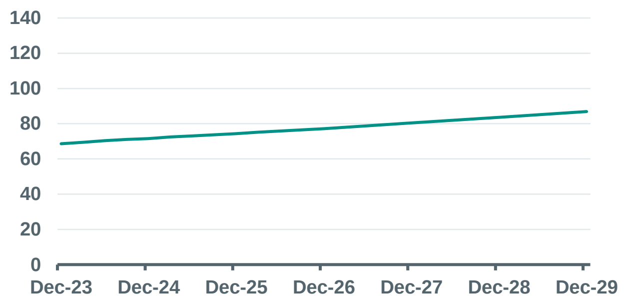
Carbon contract current prices (EU Allowance)

EUR/MT

Source: Bloomberg, ABN AMRO Group Economics

Carbon contract futures curve (EU Allowance)

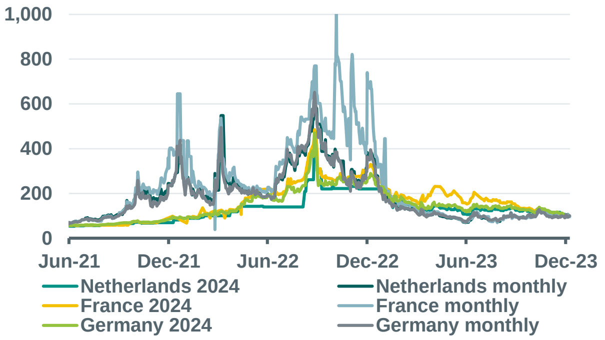
EUR/MT



Source: Bloomberg, ABN AMRO Group Economics

Electricity power prices (monthly & cal+1 contracts)

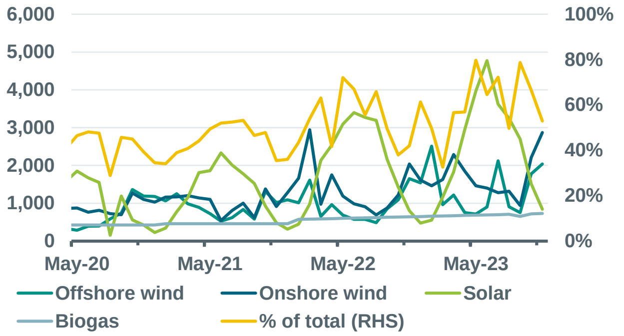
EUR/MWh



Source: Bloomberg, ABN AMRO Group Economics. Note: 2024 contracts refer to cal+1

Electricity generation from renewable sources (NL)

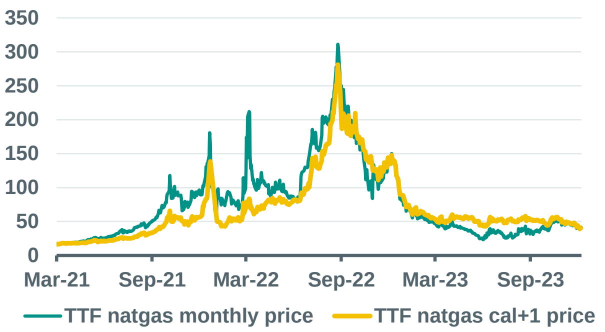
GW
% of total



Source: Energieopwek (Klimaat-akkoord), ABN AMRO Group Economics

TTF Natgas prices

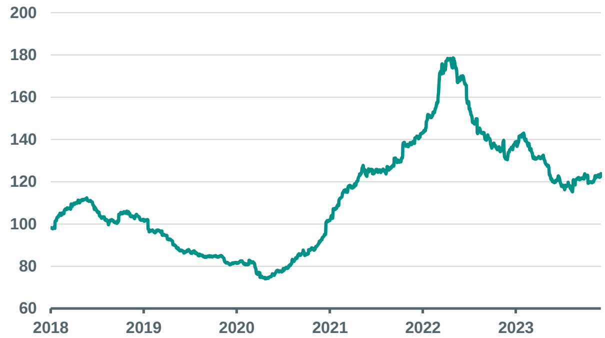
EUR/MWh



Source: Bloomberg, ABN AMRO Group Economics

Transition Commodities Price Index

Index (Jan. 2018=100)



Note: Average price trend of 'transition' commodities, such as: corn, sugar, aluminium, copper, nickel, zinc, cobalt, lead, lithium, manganese, gallium, indium, tellurium, steel, steel scrap, chromium, vanadium, molybdenum, silver and titanium. Source: Refinitiv, ABN AMRO Group Economics

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