

The Green Bond

Your insight into sustainable finance

23 December 2022



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2022 was a watershed year for the global energy transition. The energy crisis exposed the shortcomings of the existing infrastructure but is also the catalyst for a surge in investment. As European investment finally ramps up in the wake of the energy crisis of 2022 and the US starts to play catch-up with its two major rivals, we expect total renewable investment to jump by 25% in 2023, taking the total tally to close to USD 600bn.

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After the first Y/Y downturn in labelled bonds and loans ever, we expect the sustainable debt market to return to growth in 2023. With reservation that the general debt market stabilizes, we expect that sustainable borrowing will reach the record-breaking year of 2021 potentially of making 2023 the strongest year ever for sustainable bonds and loans. Growth will be driven by a stronger sustainable bond market as uncertainties about interest rates, energy prices and other economic downside risks subside.

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On December 19, Parties to the UN Convention on Biological Diversity adopted a Global Biodiversity Framework. Nicknamed the “30x30 pledge”, 196 countries agreed on targets to preserve 30% of land and sea ecosystems by the year 2030, as well as to restore 30% of the planet’s degraded terrestrial, inland water, coastal, and marine ecosystems. Parties also agreed to mobilize at least USD 200bn per year for biodiversity by 2030.

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Letter to the reader

Christmas thinking – and a wakeup call

If you were a private equity fund – with a business based on refining and repricing corporate platforms through a well-thought-out net present value (NPV) model, adjusted for current analytical preferences, but failing to incorporate into the model shifts in the society on value appreciation – you would underperform.

We hear, we know, we see that: 1) increasingly top talent demand purpose from their employer and screen their employer based on company values; 2) slowly but surely, regulators are creating a landscape which penalises pollution and rewards the clean; and 3) investors are cherry picking “future proofed” companies with expectations that sustainability is not a happening, but rather a strong, long-term trend which will determine tomorrow’s cash flows and consequently needs to be priced-in today.

Returning to the private equity fund, where senior deal makers have operated winning refinery models for decades and are consequently reluctant to alter their *modus operandi* – there is the opportunity to create a “refined” model which captures the opportunities of the transition; where exit strategies (e.g. IPOs, LBOs, etc.) have incorporated carbon budgets, procurement preferences and ongoing investments into new infrastructure.

We have seen that some private equity firms work on the transition – but also – that most of these firms work on the transition through the lens of an equity researcher. The transition is not a current snapshot of materiality seen from a linear backward-looking perspective. Instead, the transition requires a forward-looking assessment of

variables with some clarity through benchmarking – and these factors are difficult to input into a fact-based equity valuation. Thus, there is a need to evolve our private equity models and the way we calculate future value-added across markets.

On the labelled fixed income market, we have seen the first set back ever. However, the Y/Y decline is primarily driven by reduction of social bonds, which grew massively during the pandemic. It is worth mentioning that the 18% set-back of the labelled bond market is “better” than the 22% decline in the non-labelled bond market. What is an interesting observation is that in terms of total annual transactions of sustainable bonds and loans in 2022, France, Italy and the UK had significant setbacks, but Germany remained strong!

Our baseline expectation for 2023 is that the sustainable debt market will grow to USD 1.76tn (returning to 2021 issuance levels) based on growth in the US and Asia, with Europe catching up in the latter half of the year – but also with an upside due to the backlog from this year and the enormous investments required to expand and re-shape our energy system.

Enjoy your reading, Merry Christmas and I hope you and your family will have a fantastic 2023!

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Transition update

A new beginning

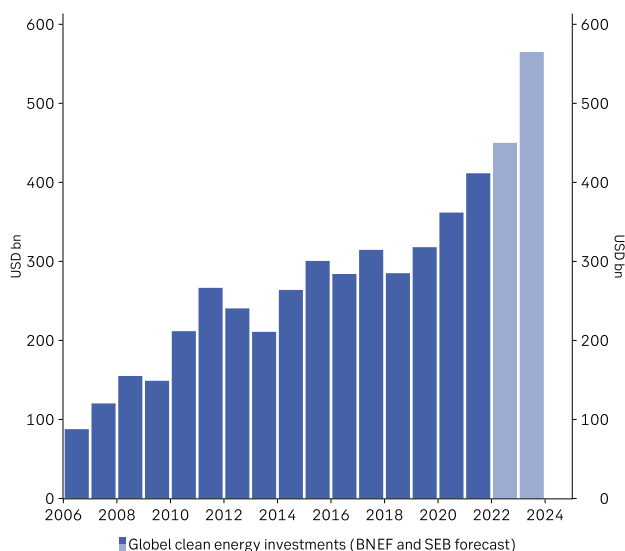
2022 was a watershed. The energy crisis exposed the shortcomings of the existing infrastructure but is also the catalyst for a surge in investment.

A new beginning

2022 was in our view a major turning point in the energy transition. On the one hand it has been a year with tremendous challenges that exposed the shortcomings of the existing energy infrastructure.

At the same time, it is also likely to go down in history as a political and economic watershed: the year when an accelerated transition truly began after a lost decade of stagnation and the world finally started aligning short-term investment with long-term climate-related objectives.

Figure 1 Clean energy investments



Source: Bloomberg New Energy Finance and SEB estimates.

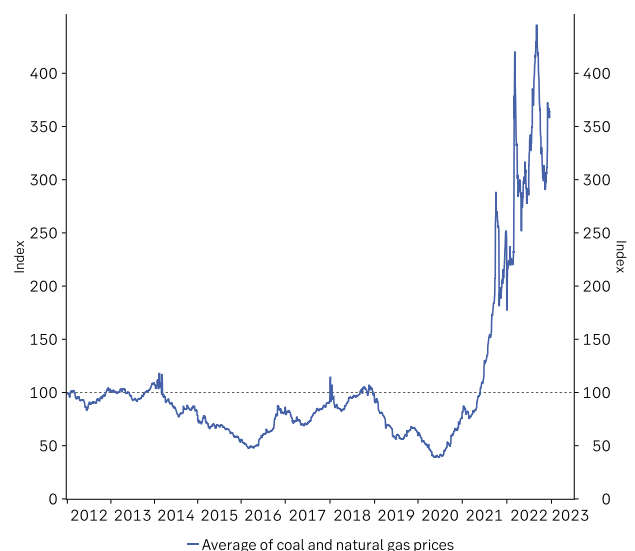
Global renewable energy investment has already increased by close to 50% since the start of this decade, driven by China, where investment has almost doubled since 2019. We estimate that 2022 will see total investment reach a record of more than USD 460bn, an increase of 15% from 2021, but this is only the beginning (Figure 1).

As European investment finally ramps up in the wake of the energy crisis of 2022 and the US starts to play catch-up with its two major rivals, we expect total renewable investment to jump by 25% in 2023, taking the total tally to close to USD 600bn, and growth is likely to continue.

Catalyst: the energy crisis of 2022

2022 has been a year of upheavals and challenges in global energy markets. It was not all due to the war in Ukraine – China had already experienced energy shortages and rolling blackouts in 2021, before the disruption of Russian gas flows to Europe, so trouble was already brewing before the invasion. However, the main reason for the extreme volatility in natural gas prices in the past year was the war and the almost complete disruption of natural gas exports from Russia to Europe that followed, as well as the impact of sanctions on oil exports from Russia.

Figure 2 Coal and natural gas price



Source: Macrobond

Coal is the closest substitute for natural gas, so the gas shortage also led to higher demand and higher prices for coal. As seen in Figure 2, the average global price of gas and coal is 5-10x higher than in the last half of the 2010s and during the pandemic. And even if European producers and consumers can afford these prices, which many energy-intensive producers clearly cannot, there may still not be enough energy to prevent blackouts this winter. The first response to such a situation is to activate any immediate energy supply that you can find, from coal to nuclear power.

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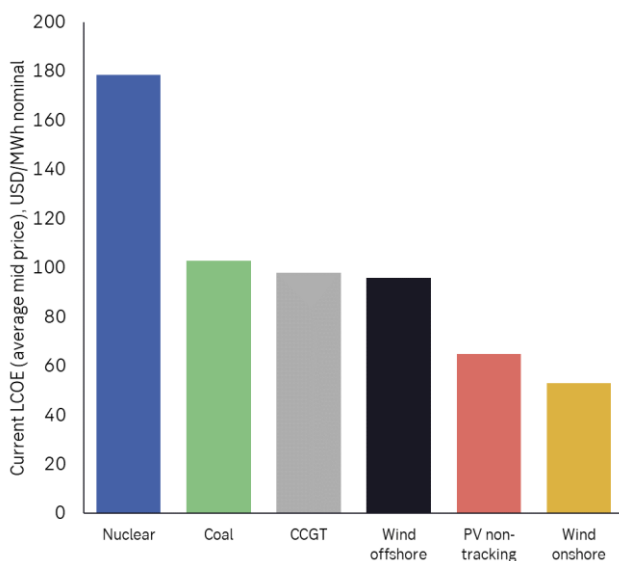
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Crisis triggers surge in energy supply

The next step is to increase long-term investment to make sure it does not happen again. The shock of an energy shortage, with its potential ramifications for political and social stability, is not one that governments will want to repeat. They will do the opposite of what happened after the financial crisis in 2008-2009, when a wave of austerity essentially ended Europe's clean energy transition.

It is also increasingly clear that a cheap, efficient, and not least independent energy system is a key parameter in the global geopolitical competition. Whatever energy supply governments invest in, it will have to come with less dependence on foreign suppliers than the one we had.

Figure 3 H2 2022 Levelized Cost of Energy



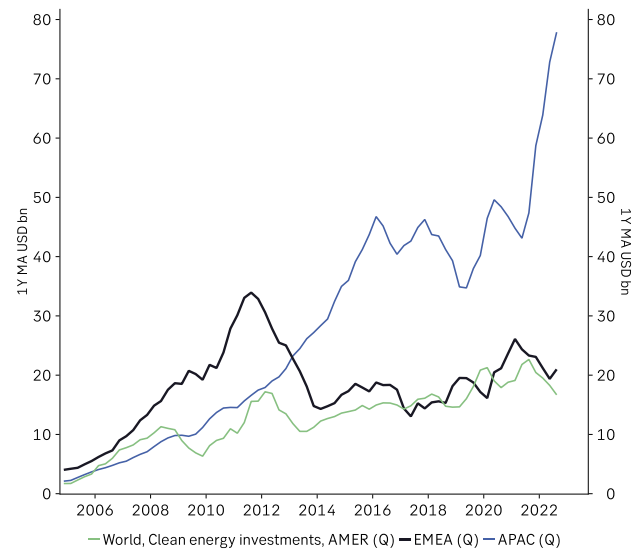
Source: Bloomberg New Energy Finance

Once the decision to significantly increase the supply of energy has been made, the next question is what kind of energy supply to invest in, and today there is no real doubt about that. Renewable energy is cheaper, more efficient, and more independent of foreign influence than both fossil fuels and nuclear power.

Updated estimates of the levelized cost of producing energy (LCOE: all costs included over lifetime including capex) from BNEF show a widening cost advantage for renewable energy compared to other alternatives (Figure 3). For onshore wind, the estimated cost is almost 50% below that of coal and gas.

And this is just the tip of the iceberg. The cost advantage is likely to increase further as investment picks up, because renewable energy has the hallmark of a true technology revolution: a steep learning curve, like Moore's law for microprocessors. As investment ramps up, the LCOE for solar and wind is likely to continue falling rapidly, creating a positive feedback loop.

Figure 4 Clean energy investments by region



Source: Bloomberg New Energy Finance

A surge in global renewable energy investment has already been underway since the start of this decade. This is especially the case in China, where the investment level has doubled since 2019 and virtually exploded after the 2021 experience of acute shortages. In Europe and the Americas, the surge is likely to come now (Figure 4).

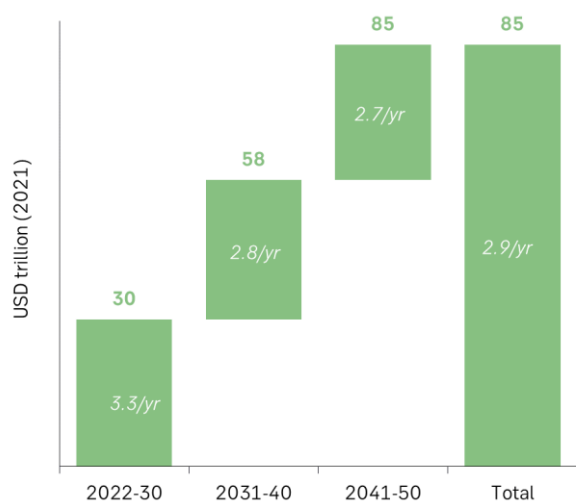
Europe was showing signs of acceleration until this year, but the war forced decision-makers to focus their attention on short-term measures, and the current investment level is still 40% below the peak right after the GFC. We expect next year to see a huge increase in Europe's renewable energy investment, driven both by governments and the EU Commission and by households and business building local supply to complement the centralized system.

Even the US appears to be realizing that they can't afford to fall too far behind China in this crucial determinant of future economic competitiveness. President Biden's Inflation Reduction Act (IRA) marks a major step up in the US ambition level, providing at least USD 369bn in support to energy transition technologies. Initial assessments suggest that the IRA is likely to reduce US emissions by 40% and drive nearly USD 3.5tn in cumulative capital investment in new energy supply infrastructure by 2032.

Much more capital needed for investment

While the surge in renewable energy investment in recent years is encouraging, we are still a long way from reaching a level that is consistent with full decarbonization by 2050.

According to updated estimates from BNEF, the annual total investment in energy supply that is consistent with their Net Zero scenario is close to USD 3tn over the next 30 years, up from 1.5-2tn in the past decade, and this number includes fossil energy investment too (Figure 5).

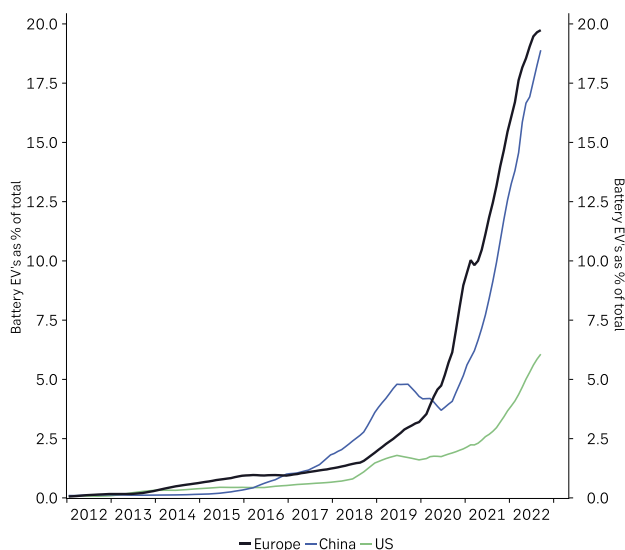
Figure 5 Energy investment in BNEFs Net Zero Scenario

Source: Bloomberg New Energy Finance

That capital requirement is front-loaded, however, with the highest investment levels needed in the first part of the transition. The net zero scenario thus has total energy investment peaking at close to USD 4tn annually in the second half of the current decade. With renewable energy taking a rising share of this investment, they would have to double from the current level and then double again within the next five years.

Electrification of energy using sectors takes off

The transition is not just about energy supplies, however, but also involves massive investment to change the demand for energy. This is a sequential process that must start with an increased supply of energy, but the next step is to develop and roll out electrified solutions for the sectors with high energy intensity.

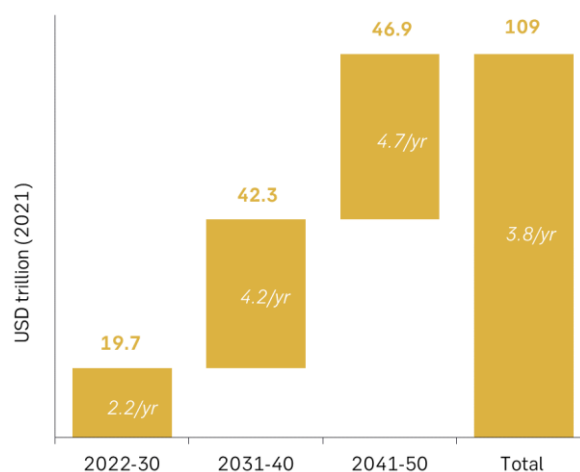
Figure 6 EVs as total share of cars sold

Source: Bloomberg New Energy Finance

The only energy-intensive sector that currently has a competitive electrified technology alternative is the automotive sector, and here the exponential diffusion is already evident in both Europe and China (Figure 6).

Compared with 2019 levels the market share of EVs has thus quadrupled in both regions and now stands at close to 20% of all vehicles sold. The US remains a laggard but is showing early signs of a similar exponential shift, albeit with a lag of a few years to the other two major regions.

This process is likely to take time and involve further technological innovation. Even for EVs which are way ahead of the curve compared with most other energy-using sectors, it is still too soon to say if the future we will be driven by better batteries or improved hydrogen fuel cells or some combination of the two. For all other energy intensive sectors, like shipping, steel production, mining or aviation, electrification technologies remain in their embryonic stage, leaving serious question-marks about what route the transition will take.

Figure 7 Global investment in low-carbon energy demand in BNEFs Net Zero Scenario

Source: Bloomberg New Energy Finance

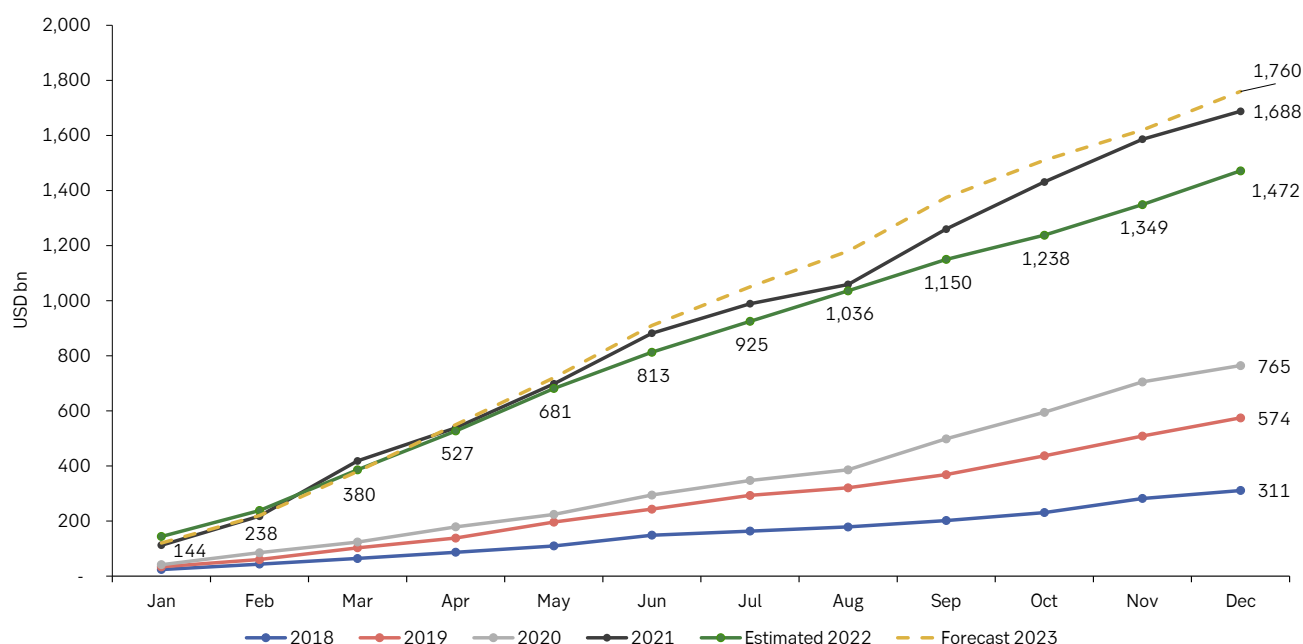
As a result, the transition investment on the demand side is backed-loaded, not front-loaded like for energy supply, with the bulk of the capital being deployed in the last half of the transition. The BNEF Net Zero scenario requires annual investment to reach USD 2tn in the 2020s, but then doubling to more than USD 4tn annually in the last 20 years of the scenario as electrification technologies mature (Figure 7). An accelerated transition will thus require large amounts of capital all the way, but with the emphasis shifting from energy supply to energy demand over time.

Sustainable Debt Market Outlook

Sustainable financing next year to reach 2021 record potentially becoming strongest ever

After the first Y/Y downturn in labelled bonds and loans ever, we expect the sustainable debt market to return to growth in 2023. With reservation that the general debt market stabilizes, we expect sustainable borrowing to reach and potentially exceed the record-breaking year of 2021. Growth will be driven by a stronger sustainable bond market as uncertainties about interest rates, energy prices and other economic downside risks subside.

Figure 8 Cumulative annual sustainable debt transactions



Source: Bloomberg New Energy Finance 30 November, SEB estimate

Return to growth in 2023 – if global debt market stabilizes

We assume that growth will return to the sustainable debt market. For this to happen, volatility in the general debt market needs to abate. Not only do we expect next year's market for sustainable bonds and loans exceed 2022 by almost 20% - but we also believe that 2023 will add 5% to the record of 2021. A greater share of the total USD 1.76tn in forecasted sustainable financing will originate in the US and Asia as Europe will take longer time to deal with economic downturn, rising interest rates and regulatory uncertainties.

Given already known risks, we expect the sustainable finance market to be at or below the level of the last couple of years in the beginning of Q1. Only if the general debt

market stabilizes towards the end of Q2 will labelled bonds and loans record Y/Y growth. It may take until 2024 before the sustainable finance market can return to the exponential growth we have seen since before the pandemic. Nevertheless, we believe that next year will continue the trend of sustainable debt taking an increasing share of the global debt market.

Sustainable bonds and in particular use of proceed bonds will be the main driver of growth in 2023. Corporates and sovereigns will need to meet increasing capital needs to succeed in the energy transition, lessen their dependence on imports, improve supply chains, and take advantage of fiscal incentives. Investors may become more confident in the market, too, as yields are improving, concerns about the risk of an earnings recession weaken and their believe in the impact of sustainable bonds grows

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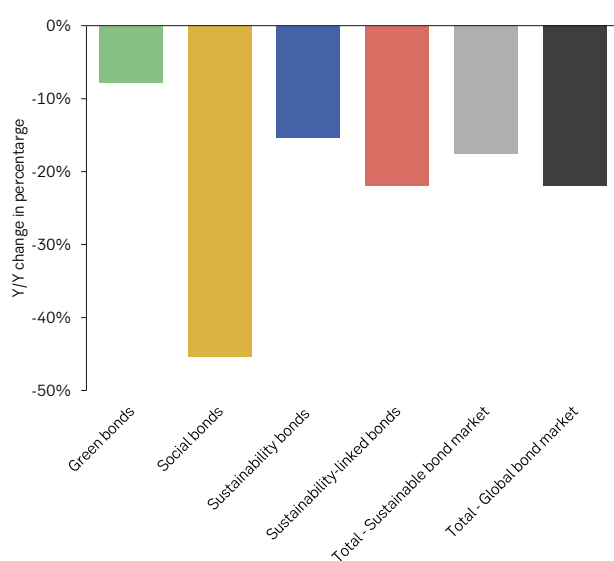
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Sustainable debt market suffers decline in 2022

There has been no shortage of headwinds for the sustainable debt market in the last twelve months. Since January, the FED has raised the federal fund target rate by 425bps, one of the steepest rate hikes in history. Even the Bank of Japan eventually joined other central banks in simultaneously raising interest rates to combat inflation stemming from supply chain disruptions. The war in Ukraine and the ensuing energy crises worsened the macroeconomic situation further by making everyone painfully aware of paramount importance of energy supply.

The paradigm shift in monetary policy, energy shortages and geopolitical tensions has led to a significant slowdown in the global bond market which declined by an estimated 22% in 2022. Against this background, sustainable bonds outperformed the general market as the volume of new issuances fell by only 18% this year. Green bonds were least affected by the slowdown in sustainable borrowing and social bonds most.

Figure 9 Estimated Y/Y change in sustainable bond market and the general bond market



Source: Bloomberg New Energy Finance 30 November 2022, SEB estimate

Lower market volatility next year conducive to sustainable financing

In 2022, changing macroeconomic conditions have brought growth in the sustainable debt market to an end – at least temporarily. Based on our assumption of a mild recession, we believe that the market for sustainable bonds and loans will be in a better position next year to withstand downward pressures and exploit its growth potential.

First, **monetary policy** will become more predictable which will bring more issuers back to the market. Central banks are nearing the end of the hiking cycle and we expect key interest rates to peak in early 2023. There may even be the chance of central banks – starting with the FED – beginning

to cut rates in late 2023 as outlined in greater detail in SEB's Nordic Outlook. Stabilization of the cost of capital – albeit at an elevated level – could help reinvigorate the corporate bond market including those geared at promoting sustainability. Growing confidence in central banks nearing the end of the rate hiking cycle could also clear the backlog of already allocated financing that was put on hold in 2022.

Second, **fiscal policy** measures promoting clean economic activities will be another driver for sustainable investments in 2023. The US's Inflation Reduction Act (IRA) which will provide at least USD 369bn over the coming years to the energy transition will take effect already in January. Lawmakers in the EU are currently working its response to the IRA. Nevertheless, the IRA gives the US a head-start which is why we believe that the corporate sustainable debt market there will grow more strongly than in Europe.

Third, the **energy crises** will undoubtedly continue to cast its shadow onto next year. Prices for natural gas and electricity are unlikely to subside next year as the war in Ukraine and supply chain bottlenecks continue. In this environment, widening cost advantages of renewables over conventional fuels strengthen the case for frontloading investments in clean energy projects. To what extent its improving economics will result in greater investments in renewable energy will depend on the ability of issuers to overcome problems with project origination.

Fourth, the sustainable debt market will depend on the overall **macroeconomic situation**. According to SEB's latest assessment¹, 2023 will be characterized by a widespread household-led economic downturn. Persistently high energy prices are the main reason why the US and the EU are expected to enter a mild recession next year. Rising yields could mean a flight to quality when it comes to sustainable debt – something that was already observable in 2022 with sustainable debt finance Y/Y up 12% in Germany but down 18% in Italy and 34% in the UK, respectively.

Fifth, **regulation** will have stronger bearing on investors and corporates' sustainability-related investment decisions. Greater regulatory scrutiny of ESG investments could mean that issuers will have to put more effort in allaying greenwashing concerns. The sustainable bond market will need to improve how it meets increasing demand from investors for demonstratable impact. Particularly, increased scrutiny of performance-based debt will make poor ambition harder to sell. In the EU, lack of clarity about future transparency requirements of sustainable bonds risk delaying upcoming deals. At the same time, new requirements for taxonomy-alignment reporting may help corporates to identify existing and future investments into climate change action.

COP15 – Nations reach historic agreement to protect nature at UN biodiversity conference

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Paris Agreement for biodiversity

On Monday, December 19, the fifteenth meeting of the UN Conference of the Parties to the Convention on Biological Diversity, also known as the “Biodiversity COP”, or COP15, concluded in Montreal. The conference was originally planned to take place in the spring of 2020 in Kunming, China, but was rescheduled several times due to the COVID-19 pandemic, with the location eventually changed to Montreal, Canada. After all the logistical challenges and accompanying pessimistic forecasts, the final deal of the conference came as a pleasant and welcome surprise: the parties adopted a Global Biodiversity Framework¹, which is already being hailed as the “Paris Agreement” for biodiversity.

In the final deal, nicknamed the “30x30 pledge”, 196 countries agreed on targets to preserve 30% of land and sea ecosystems by the year 2030, as well as to restore 30% of the planet’s degraded terrestrial, inland water, coastal, and marine ecosystems. Moreover, the parties agreed on a target to, by 2025, “identify, eliminate, phase out, or reform incentives, including subsidies, harmful for biodiversity (...) by at least USD 500bn per year by 2030”. Additionally, at least USD 200bn per year is to be mobilized for biodiversity by 2030, including finance made available by rich countries for developing countries and their efforts to preserve and restore biodiversity.

Interestingly, the United States did not sign on to the pledge, as it is not a party to the Convention on Biological Diversity, and only participated in the conference on its side-lines. The US president Joe Biden has already signed an

executive order that would, similarly to the 30x30 pledge, place 30% of the US nature under protection. However, it is possible that this legislature will be blocked from entering law.

Framework on protecting and restoring nature

Unlike COP27, which took place earlier in the year in Egypt and focused on adaptation and mitigation of climate change through reduction of greenhouse gas emissions, the conference in Montreal had to produce a framework on how all parts of the human society can restore, protect, and sustainably use biological diversity and natural resources. This framework came not a moment too soon, as scientists around the world are sounding the alarm on the threat of biodiversity loss. According to the World Economic Forum, over half of the world’s GDP is moderately or highly dependent on nature. At the same time, human activity is causing a rapid decline in natural resources, which, according to some researchers, is going to result in an event of mass extinction, if it continues at the current rate.

In this light, it is impossible to doubt the importance of the agreement reached in Montreal. Activists and NGO’s, who have long called on governments to act on the biodiversity front, have also welcomed the deal. The Director General of WWF International, Marco Lambertini, called it a “win for people and the planet”, adding that the agreement “must be the launch pad for action from governments, business and society to transition towards a nature-positive world, in support of climate action and the Sustainable Development Goals”². At the same time, WWF raised concerns that the

¹ RECOMMENDATION ADOPTED BY THE WORKING GROUP ON THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK ([cbd.int](https://www.cbd.int/))

² COP15: Global biodiversity deal agreed - EU must follow with strong law to restore nature | WWF

agreement can be undermined by slow implementation and lack of accountability.

Private sector engagement

One way to ensure that concrete actions are taken to reach the targets of the Kunming-Montreal agreement is to engage all sectors of the society, not relying solely on governments to implement these commitments. In the past year, we have seen a growing interest in the topic of biodiversity from our clients in all sectors, including corporates, investors, and SSA's. Some of them are only beginning to recognize the importance of addressing biodiversity loss, while others are already implementing structures for measuring and reducing their impact.

For most of our clients, as for ourselves, the biggest challenge in addressing biodiversity loss lies in finding and selecting the right metrics. Biodiversity and ecosystems are extremely complex, and our impact on them cannot be measured in a single unit, as is the case with greenhouse gas emissions. Additional complexity lies in the lack of benchmarks and historical performance that impact could be measured against in any given industry.

Despite these challenges, some companies and institutions are already today taking active action to address biodiversity loss through use of financial instruments. The Wildlife Conservation Bond issued by the World Bank earlier this year is a great example of such action³. Another example is the €300m Climate Fund for Nature, launched by Kering and L'Occitane Group, and announced on the side-lines of COP15⁴.

Moreover, earlier this month, Principles for Responsible Investment published a statement, in which 150 financial

institutions, managing over USD 24tn, called for adoption of an ambitious Global Biodiversity Framework, and committed to, within their own organizations, working towards the goal of "living in harmony with nature by 2050"⁵. These are just a few examples of actions being taken already today, and we will undoubtedly see more of such commitments in 2023 and the coming years.

Integration of biodiversity and nature into business and finance

Just as it happened with climate-related disclosures after 2015, all financial institutions and corporates today are experiencing a push towards integrating nature-related disclosures into their work, both internally, and externally. There is certainly a lot of hope that the framework currently being developed by the Task Force on Nature-related Disclosures (TNFD) will move and shape the market in the same way as the Task Force on Climate-related Disclosures (TCFD) once did for climate. Moreover, the commitments that financial institutions and corporates have made to sustainability-focused initiatives will likely expand to include considerations around ecosystems and biodiversity.

Eventually, the greater integration of biodiversity and nature into business and financial decision making will also result in targeted investments. In 2022, we have seen some smaller biodiversity-related transactions. We expect this trend to grow over the coming years and look forward to a challenging but rewarding journey.

³ [Wildlife Conservation Bond Boosts South Africa's Efforts to Protect Black Rhinos and Support Local Communities \(worldbank.org\)](https://www.worldbank.org/en/news/press-release/2022/07/20/wildlife-conservation-bond-boosts-south-africa-s-efforts-to-protect-black-rhinos-and-support-local-communities)

⁴ [Kering and L'OCCITANE Group join forces to finance nature protection at scale with the Climate Fund for Nature | Kering](https://www.kering.com/en/press-releases/2022/07/20/kering-and-loccitane-group-join-forces-to-finance-nature-protection-at-scale-with-the-climate-fund-for-nature)

⁵ [UNPRI statement at COP15](https://www.unpri.org/press-releases/unpri-statement-at-cop15)

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“The Green Bond” is SEB’s research publication that strives to bring you the latest insight into the world of sustainable finance – one theme at a time. Even though the publication covers all kinds of products and developments in the sustainable finance market, we decided to keep its historic name – “The Green Bond” – as tribute to our role as a pioneer in the Green Bond market.

You may be wondering why a Scandinavian bank chose a picture of bamboo for the cover. There is a reason for that too! Bamboo is one of the fastest growing plants on the planet, which makes it an efficient mechanism of carbon sequestration. Moreover, once grown, bamboo can not only be used for food, but also used as an ecological alternative to many building materials and even fabrics. Its great environmental potential makes bamboo a perfect illustration of our work and aspirations.

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Cut-off date for calculations was 30 November 2022, unless otherwise stated.

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