Funding high-impact climate action with green bonds

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The past five years have been the hottest since records began. In the decade to 2020, global surface temperatures were 1.09C higher compared to the pre-industrial era (1850–1900)[1]. The Intergovernmental Panel on Climate Change (IPCC) warns that stabilising global warming below the 1.5C level is critical to avoiding the most extreme impacts on ecosystems and human health, which would be severe at the 2C level[2].

We already witness instances of erratic and extreme weather associated with climate change. As this is being written, devastating wildfires—a disturbingly regular occurrence nowadays—are ravaging Turkey, Greece, and California[3] . The Center for Climate and Energy Solutions says that climate change is a "key factor" in increasing the risk and extent of wildfires[4]. Meanwhile, fatal flooding in Germany and Belgium in mid-2021 was caused by rainfall levels unseen in the past 1,000 years[5].

A recently released landmark IPCC study warns we are likely to breach the 1.5C mark within 20 years if urgent action is not taken. It estimates a mere 50% chance of staying below the 1.5C limit if total CO2 emissions are kept below 500 gigatons[6].

Considering that global C02 emissions stood at about 36.4 billion tons in 2019 and 34 billion tons in 2020[7], our "carbon budget" could be used up in less than 15 years. It is telling that, despite widespread pandemic-related lockdowns, C02 emissions only fell by 6.6% in 2020. Most of this decline came from the transportation sector. But the top three greenhouse gas-emitting sectors are electricity, industrial production, and agriculture[8].

In short, more needs to be done—and quickly.

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[1] https://www.bbc.com/news/science-environment-58130705
[2] https://www.ipcc.ch/site/assets/uploads/2018/11/pr_181008_P48_spm_en.pdf
[3] https://www.aljazeera.com/news/2021/8/7/at-least-8-missing-as-historic-california-wildfire-rages; https://apnews.com/article/europe-fires-athens-heat-waves-4fca06093b6e4c0c463210dfe7fb4cfb
[4] https://www.c2es.org/content/wildfires-and-climate-change/
[5] https://www.nytimes.com/2021/07/16/world/europe/germany-floods-climate-change.html
[6] https://www.bloomberg.com/news/features/2021-08-09/ipcc-report-human-caused-climate-change-unequivocal
[7] https://www.statista.com/statistics/276629/global-co2-emissions/
[8] https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

The current landscape of climate change mitigation efforts

Realistically, there is no single overarching solution that would hit the required targets for reducing carbon emissions. The broad transition toward electric vehicles and renewable energy sources are big needle movers, but technological, socio-political, and economic barriers remain.

For instance, the International Energy Agency (IEA) calls nuclear power an "essential foundation" for the energy transition[9]. Yet, heavy socio-political opposition means it is being phased out in countries such as Germany.

Meanwhile, renewable energy sources like solar and wind must contend with natural peaks and troughs in electricity production. A complete switch to such sources would require cost-efficient energy storage solutions. One popular study estimates storage costs would need to be below USD 20/kWh to meet baseload demand 100% of the time. This target rises to USD 150/kWh if it only needs to meet demand 95% of the time[10]. The good news? Lithium-ion battery packs—although mainly used in electric vehicles—have now reached USD 137/kWh and are only expected to fall further[11].

Many novel technological solutions are also still in the development stage. For example, "zero-carbon concrete", material that requires net-zero carbon emissions to produce, has long been a holy grail. Concrete is the second most-consumed product in the world and a significant contributor to greenhouse emissions. As a McKinsey analysis concluded, new technologies and alternative building materials may be the only way to achieve this goal[12].

All in, hitting the carbon emissions targets necessary to stave off the worst impacts of climate change would require a combination of developing new technologies and working on improving current ones. Both are important, and both will need financing. The question then becomes: what is the best way for allocating capital to these projects?

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Financing the fight against climate change

Just as the solutions needed are diverse, so too must the sources of capital. We need a multi-pronged approach of venture-style, equity, and fixed income. For instance, venture-style investing would be most appropriate for financing novel technological solutions, given such investments' high-risk, high-reward nature. Venture capital would flow into innovative and enterprising startups—many of which would statistically fail—to find the outlier that eventually succeeds.

The global scale of climate change means that all levels of entities, from supranationals and governments down to individual companies, must be involved in mitigation efforts. Only governments have the power to drive the large-scale energy transition and greenlight the necessary infrastructure spending to achieve it.

This is where fixed-income instruments come into play.

[9] https://www.iea.org/reports/net-zero-by-2050
[10] https://www.cell.com/joule/fulltext/S2542-4351(19)30300-9
[11] https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/
[12] https://www.mckinsey.com/industries/chemicals/our-insights/laying-the-foundation-for-zero-carbon-cement

Focusing on immediate-impact infrastructure-based solutions

It can be strange to think of bonds – often seen as more secure long-term investments – as the ideal financing instruments for "immediate impact" climate change solutions. But compared to vehicles like green venture funds, where any large-scale impact may only come into fruition a decade from now, bonds used to finance infrastructure-based solutions can indeed have the most immediate effect.

The reason is that countries must take action that can make a difference today. Although still requiring years to complete, these involve large-scale infrastructure projects that can make an immediate impact, as they are based on existing technology. Examples include energy-efficient buildings and power grids for transporting renewable energy.

The scale of such projects necessitates the involvement of governments and supranational agencies like development banks. And their preferred method of financing is with bonds.

Using green bonds to meet the USD 100 trillion net-zero target

The IEA estimates the world needs over USD 4 trillion in investments per year for the next 30 years to reach net-zero emission targets by 2050[13]. While investments in renewable energy have been increasing, there is still a gap that must be plugged. For example, the IEA projects global energy investment at USD 1.9 trillion in 2021[14] —and that includes all sources of energy, not just renewable.

Green bonds—bonds explicitly issued to finance sustainable projects—are a critical mechanism for helping bridge this gap. They represent a fast-growing segment of the USD 128.3 trillion global fixed-income market[15]. In the first half of 2021, total global green bond issuance stood at USD 575 billion, already USD 100 billion more than the entirety of 2020[16]. It is highly probable that total issuance will hit the USD 1 trillion mark this year.

While this seems still a way off from the levels of investment necessary to hit the USD 4 trillion-a-year target, we should remember that green bonds are only one part of the broader solution. Indeed, these issues are an indispensable and fast-growing element, but they remain only one piece of a bigger puzzle. Keep in mind that global ESG assets are estimated to hit USD 53 trillion within five years[17].

Furthermore, considering the current pace of growth, we are optimistic that green bonds will soon become one of the primary sources of financing for climate-change mitigation efforts. This growth is supported by several converging current trends—from investor attitudes and national priorities to market demand. It is why global ESG debt, including green bonds, is expected to hit USD 11 trillion by 2025[18]. That projection may be conservative, as it assumes ESG debt will grow at only half the pace of the previous five years.

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[13] https://www.iea.org/reports/net-zero-by-2050
[14] https://www.iea.org/reports/world-energy-investment-2021/executive-summary
[15] https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/Secondary-Markets/bond-market-size/
[16] https://www.bloomberg.com/news/articles/2021-07-13/esg-bond-sales-sprint-to-1-trillion-as-investors-force-change
[17] https://www.bloomberg.com/professional/blog/esg-assets-may-hit-53-trillion-by-2025-a-third-of-global-aum/
[18] https://www.bloomberg.com/professional/blog/esg-assets-may-hit-53-trillion-by-2025-a-third-of-global-aum/

Governments embracing the urgency of mitigating climate change

One of the most significant growth drivers of the green bond market is national priorities—specifically, the prioritisation of net-zero targets. One hundred thirty-seven countries have made carbon neutral commitments, including the world's top carbon producers: the US, China, and the EU[19]. While India has not made a firm carbon neutral commitment, it intends to stick to the Paris pledge by reducing its carbon footprint by about 35% from 2005 levels by 2030. Its government has also targeted reaching renewable energy capacity that is five times its current capacity by 2050[20].

Green bonds are a crucial financing vehicle to achieve these goals. For instance, the People's Bank of China is bringing its green bond framework up to speed with its European counterparts to encourage foreign investment. The country will also need about USD 21.5 trillion worth of green investment over the next 40 years, a significant percentage of which will require bond financing[21]. China is already one of the largest green bond issuers globally and the largest among emerging markets, followed by India[22].

The upcoming COP26 climate summit is also expected to extract firmer carbon reduction commitments from governments. This is especially the case given the IPCC's latest report, which emphasises the urgency of taking more forceful action[23].

> **"The need to finance net-zero carbon emission projects contributes to the robust supply of green bonds. But this supply is also being met by corresponding demand as investors – both institutional and retail – who grasp the importance of using their capital to aid in the climate change mitigation effort.**

Shifting investor attitudes creating market demand

The need to finance net-zero carbon emission projects contributes to the robust supply of green bonds. But this supply is also being met by corresponding demand as investors—both institutional and retail—who grasp the importance of using their capital to aid in the climate change mitigation effort.

At the retail level, the younger generations—millennials and Gen-Zs—rank climate change as a top concern[24]. In fact, the millennial generation spurred the rise of the entire sustainable investing movement, which has dramatically accelerated in the past few years[25]. As Gen-Z matures and becomes a legitimate investing force, this trend will only be amplified.

Fund houses have also stepped up—both in response to demand and as an acknowledgement of the responsibility they hold. There are currently almost 4,000 signatories to the UN's Principles of Responsible Investing, commanding a cumulative USD 121.3 trillion in assets under management[26]. A recent survey found that 73% of Asian institutional investors and 49% of Western investors believe that they should consider climate change in their portfolios[27].

[19] https://www.un.org/en/climatechange/net-zero-coalition
[20] https://www.reuters.com/article/us-climate-change-india-exclusive-idUSKBN2BM1AA
[21] https://www.reuters.com/article/china-cicc-greenfinance-idUSL4N2MG013
[22] https://www.businesstoday.in/opinion/columns/story/green-bonds-indias-best-bet-against-climate-change-302498-2021-07-27
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[26] https://www.unpri.org/pri/about-the-pri
[27] https://www.statista.com/statistics/1155432/obligation-institutional-investors-climate-change-global-region/

In our over 10 years in the green bond market, we are encouraged by where the market is heading now. We see it becoming more extensive, transparent, and investor friendly.

Toward a more transparent and investor-friendly green bond market

Considering that green bonds are a relatively new asset class, it is only natural that some investors are apprehensive. One common concern is that green bonds are more expensive—offering lower yields to investors—due to the relative scarcity of supply compared to demand.

However, this has largely been negated by the growing supply of green bonds. Our research finds that there is no apparent systematic pricing difference between green bonds and conventional bonds. Other robust studies have corroborated this[28]. Furthermore, as the green bond supply continues to expand—moving from niche to mainstream—any pricing differentials will likely be eliminated. And when factoring in the tax incentives available to certain green bond investors[29], green bonds look even friendlier to investors.

Another common apprehension is surrounding transparency. Investors may be worried about “greenwashing” —where the “green” label ends up being more hype than substance. This is indeed a legitimate concern. But this is also an area where we see it becoming less and less of an issue moving forward, particularly as stricter regulations and more robust guidelines are released.

For instance, in April 2021, the European Commission adopted a comprehensive taxonomy that creates a science-based language that investors can utilise when investing in sustainable projects[30]. China has announced it is cooperating with the EU to create jointly recognised green investment taxonomies[31]. All these constitute a significant step forward toward eliminating greenwashing.

The future is bright, but immediate action is needed

Ultimately, we see green bonds becoming a mainstream sub-asset class within fixed income. As the market grows, we will see more traditional bond funds transitioning into becoming green bond funds—something that was impractical with a smaller market.

While the future of the green bond market looks bright, the data clearly shows that taking immediate action is imperative. Funding investments that can make a direct impact, such as large-scale infrastructure-based projects, is an ideal way to do this.

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28 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3333847
29 https://www.climatebonds.net/policy/policy-areas/tax-incentives
30 https://ec.europa.eu/commission/presscorner/detail/en/IP_21_1804
31 https://www.ft.com/content/cddd464f-9a37-41a0-8f35-62d98fa0cca0

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