



INSTITUTE OF ENERGY
FOR SOUTH-EAST EUROPE



INSTITUTE OF ENERGY
FOR SOUTH-EAST EUROPE

GREEN
BONDS



SUSTAINABLE FINANCING THROUGH GREEN BONDS

Advisory Note No3

April 2023

IENE Advisory Note (No 3)

SUSTAINABLE FINANCING THROUGH GREEN BONDS

Prepared by IENE's Research and Analyst Department

Institute of Energy for South East Europe (IENE)

3, Alexandrou Soutsou, 106 71 Athens, Greece

tel: +0030 210 36 28 457, 3640 278, fax: +0030 210 3646 144

website: www.iene.eu, e-mail: secretariat@iene.gr

Copyright ©2023, Institute of Energy for S.E. Europe

Legal notice

Neither the IENE nor any person acting on behalf of IENE is responsible for the use, which might be made of the information contained in the Briefing Note. The report does not represent any official position of IENE, nor do its contents prejudge any future IENE activities in any areas of its work.

Table of Contents

Table of Contents	3
Preface	4
1. Sustainable Finance	4
2. What is a Green Bond (and How Does it Differ from an Ordinary Bond)?	8
3. Global Green Bond Activity (2021, Q3 2022 and 2022)	11
4. Selection of Projects Funded Through Green Bonds	25
5. Prospects for Issuing Green Bonds in SE Europe	27
6. Basic Parameters for a Successful Green Bond Issuance	34
7. Who Can Issue a Green Bond?	41
8. Criteria for Issuing a Green Bond	42
9. The Role of Green Bonds in Assisting RES & Clean Technology Companies to Grow	45
10. IENE’s Advisory Role in the Issuance of Green Bonds	48
Appendix I – The Institute of Energy for SE Europe	50

Preface

IENE has placed high on its agenda the promotion of Sustainable Financing through Green Bonds as well as Responsible Corporate Governance.

As more and more companies are incorporating sustainability criteria into their business strategy in order to effectively manage global challenges and risks and ensure long-term prosperity, there is growing interest in alternative financing methods. Disclosure of non-financial information ESG has become a particularly important tool, as transparency in relation to these indicators makes businesses more attractive to investors, acts as a risk aversion measure, facilitates companies access to finance and makes them more competitive.

Complementing the ESG strategy and criteria for sustainable financing, “Green Bonds” have emerged of late as a smart tool for attracting funding for specific projects and clean energy technology applications.

As of January 2021, IENE became the first organisation in Greece and SE Europe to be granted Approved Verifier status under the Climate Bond Standard. This is a significant milestone in the development of Green Bond markets in SE Europe.

As an Approved Verifier, IENE is in a position to assess project eligibility against the solar, wind, biomass, geothermal, energy efficiency, cogeneration and low carbon buildings criteria under the Climate Bonds Standard for green bond issuance. Verification services will be provided across all low carbon energy sectors for pre-issuance and post-issuance assurance.




1. Sustainable Finance¹

Sustainable finance refers to the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects. Environmental

¹ https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance_en

considerations might include climate change mitigation and adaptation, as well as the environment more broadly, for instance the preservation of biodiversity, pollution prevention and the circular economy. Social considerations could refer to issues of inequality, inclusiveness, labour relations, investment in human capital and communities, as well as human rights issues. The governance of public and private institutions – including management structures, employee relations and executive remuneration – plays a fundamental role in ensuring the inclusion of social and environmental considerations in the decision-making process.

Table 1: ESG measures businesses' environment, social and governance credentials

		
Environmental	Social	Governance
<ul style="list-style-type: none"> Renewable fuels Greenhouse gas (GHG) emissions Energy efficiency Climate risk Water management Recycling processes Emergency preparedness 	<ul style="list-style-type: none"> Health and safety Working conditions Employee benefits Diversity and inclusion Human rights Impact on local communities 	<ul style="list-style-type: none"> Ethical standards Board diversity and governance Stakeholder engagement Shareholder rights Pay for performance

Ενεργοποιήστε τα Windows
Μετάβαση στις ρυθμίσεις για ε
Windows.

Source: World Economic Forum

Sustainable finance has a key role to play in delivering on the policy objectives under the European Green Deal as well as the EU's international commitments on climate and sustainability objectives. It does this by channelling private investment into the transition to a climate-neutral, climate-resilient, resource-efficient and fair economy, as a complement to public money. Sustainable finance will help ensure that investments support a resilient economy and a sustainable recovery from the impacts of the COVID-19 pandemic.

Within the framework of the European Green Deal the Commission announced a renewed sustainable finance strategy. The Commission published its "strategy for financing the

transition to a sustainable economy”² on 6 July 2021. The new sustainable finance strategy aims to support the financing of the transition to a sustainable economy by proposing action in four number of areas: transition finance, inclusiveness, resilience and contribution of the financial system and global ambition. The new strategy proposes action in a number of areas. First, it will consider extending the EU taxonomy framework and sustainable finance standards and labels to recognise transition efforts. It stresses the importance of inclusion, to support SMEs, individuals and the real economy on the path to sustainability. It does this by providing the right tools and incentives to access transition finance, and also by exploring how to exploit the opportunities digital technologies offer for sustainable finance. It also highlights the necessity for the financial system to become more resilient to the risks posed by climate change and environmental degradation – and the steps needed to achieve this. Finally, the strategy presents the Commission’s international approach, including work on global convergence on standard setting, such as on taxonomy and disclosures.

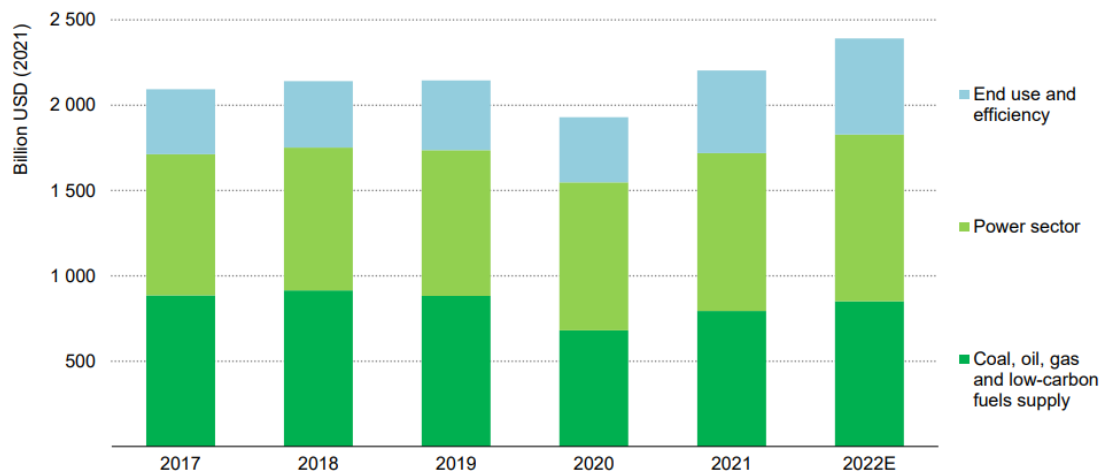
High fuel prices, inflationary pressures and supply chain bottlenecks, the urgent need to accelerate the energy sector’s transformation to net zero, and the Russian invasion of Ukraine have created a potent mix of pressures and incentives for energy investors. Investment is central to tackling the multiple strands of today’s energy crisis: to relieve pressure on consumers, to get the world on a net zero pathway, to spur economic recovery, and – for Europe in particular – to reduce reliance on Russia following its invasion of Ukraine.

According to IEA’s “World energy investment 2022”³ global investment is set to rise over 8% in 2022 to reach a total of USD 2.4 trillion, well above pre-Covid levels. Investment is increasing in all parts of the energy sector, but the main boost in recent years has come from the power sector – mainly in renewables and grids – and from increased spending on end-use efficiency. Investment in oil, gas, coal and low-carbon fuel supply is the only area that, in aggregate, remains below the levels seen prior to the pandemic in 2019.

² https://finance.ec.europa.eu/publications/strategy-financing-transition-sustainable-economy_en

³ IEA “World Energy Investment 2022”, <https://iea.blob.core.windows.net/assets/b0beda65-8a1d-46ae-87a2-f95947ec2714/WorldEnergyInvestment2022.pdf>

Figure 1: Global Energy Investment



Source: IEA

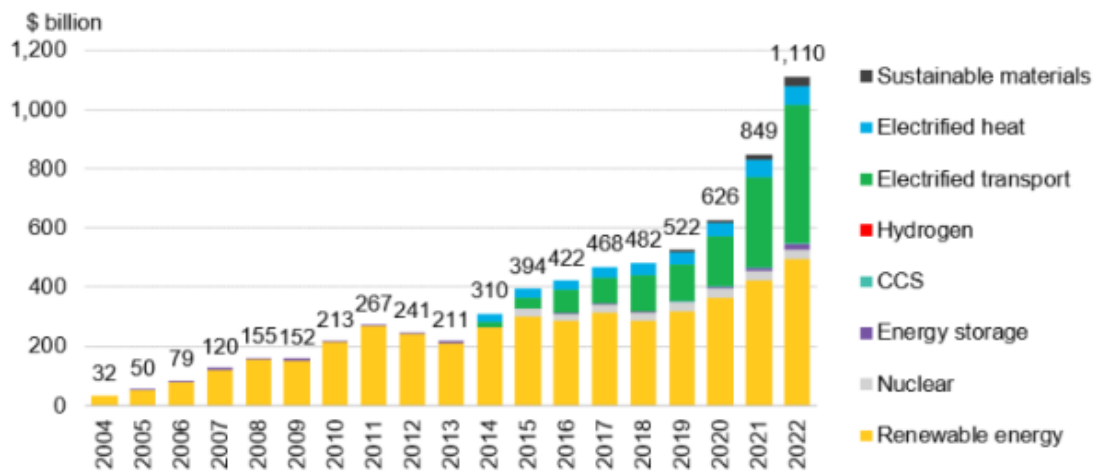
As of the low-carbon energy transition, Bloomberg New Energy Finance (BNEF) estimated that global investment totalled \$1.1 trillion in 2022 – a new record and a huge acceleration from the year before – as the energy crisis and policy action drove faster deployment of clean energy technologies⁴.

Renewable energy, which includes wind, solar, biofuels and other renewables, remained the largest sector in investment terms, achieving a new record of \$495 billion committed in 2022, up 17% from the year prior. However, electrified transport, which includes spending on electric vehicles and associated infrastructure, came close to overtaking renewables, with \$466 billion spent in 2022 – an impressive 54% increase year-on-year.

Hydrogen is the sector that received the least financial commitment at just \$1.1 billion in 2022 (0.1% of the total), despite strong interest from the private sector and growing policy support. Hydrogen is, however, the fastest-growing sector with investment more than tripling over the year before.

⁴ <https://about.bnef.com/blog/global-low-carbon-energy-technology-investment-surges-past-1-trillion-for-the-first-time/>

Figure 2: Global investment in energy transition by sector



Source: BNEF

Despite 2022's impressive results, BNEF stresses that global investment in lower-carbon technologies remains woefully short of what is needed to confront climate change. For the world to get on a 2050 "net-zero" CO₂ emissions trajectory, such investment must immediately triple, BNEF estimates. Including the additional \$274 billion invested in the power grid, energy transition investment hit \$1.38 trillion in 2022. By comparison, the world must invest an annual average of \$4.55 trillion for the remainder of this decade in order to get on track under BNEF's Net Zero Scenario⁵.

In order to cover all these financial needs in clean forms of energy, government funding is not enough, it is necessary to raise funds from the private sector. One means of financing such projects is Green Bonds.

2. What is a Green Bond (and How Does it Differ from an Ordinary Bond)?

A green bond is a debt security that is issued to raise capital specifically to support climate-related or environmental projects. This specific use of the funds raised - to support the financing of specific projects - distinguishes green bonds from regular bonds. Thus, in addition

⁵ In the Net Zero Scenario (NZS), BNEF modeling indicates that the world can stay on track for 1.77C, and global net zero by 2050, with rapid deployments of clean power generation, electrification, and, to a lesser extent, carbon capture and storage and hydrogen.

to evaluating the standard financial characteristics (such as maturity, coupon, price, and credit quality of the issuer), investors also assess the specific environmental purpose of the projects that the bonds intend to support.

Green bonds are used solely for environmental goals, while sustainable bonds combine both environmental and social objectives. There are also social bonds, whose proceeds are dedicated to projects aimed at improving social welfare or helping disadvantaged populations. The range of socially conscious instruments keeps growing as more investors look to do good while making money, and regulators look to the instruments to influence policy and investment decisions. There are now loans linked to specific environmental, social or governance targets, which give companies an incentive to achieve what they say they will. And in October 2018, the Seychelles sold the world's first sovereign blue bond⁶, debt issued to finance marine and ocean-based projects that have positive environmental, economic and climate benefits.

Someone may wonder how green are green bonds. In its analysis⁷, Oslo-based Cicero uses three shades of green:

- dark green for things that will lower carbon emissions in the long run like wind energy
- medium green for things that take a good step forward such as plug-in hybrid buses
- light green for environmentally friendly steps that won't change the long-term outlook on their own, such as more efficient fossil-fuel infrastructure

Green bonds can be **issued** by central and local government, banks or corporations. The green bond label can be applied to any debt format, including private placement, securitisation,

⁶ World Bank (2019), "Seychelles launches World's First Sovereign Blue Bond", <https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-first-sovereign-blue-bond>

⁷ CICERO (2015), "CICERO Shades of Green", <https://www.cicero.oslo.no/en/posts/single/cicero-shades-of-green>

covered bond, as well as labelled green loans which comply with the Green Bond Principles (GBP⁸) or the Green Loan Principles (GLP⁹).

More specifically, issuers from more than 50 countries have sold green bonds including supranational institutions such as the World Bank and the EU's European Investment Bank. Companies are also in the market, along with local, state and national governments. The first emerging-market green bond was issued in South Africa in 2012. Poland opened the sovereign market in 2016, followed by the likes of France, Belgium and Ireland. The US is the largest source overall, led by the mortgage giant Fannie Mae and local governments selling notes to finance infrastructure such as sewerage upgrades.

The **buyers** of green bonds include institutional investors such as pension funds, insurance companies and asset managers. The overall green market is also getting a boost from investors seeking "responsible" or "sustainable" places to put their money. That has helped Europe's listed green funds double assets under management since 2013 to more than €32 billion in 2017, according to Novethic¹⁰, a sustainable finance data provider. In 2015, France became the first country to require institutional investors to report how they consider environmental factors. The EU is likely to encourage asset managers across the bloc to integrate sustainability requirements into investment decisions as part of its work on the Green Bond Standard.

Milestones in Global Green Bond Market Evolution¹¹

2007: European Investment Bank issued the first Climate Awareness Bond.

2008: World Bank issued its first green bond.

2010: The Climate Bonds Initiative launched the Climate Bond Standard.

⁸ International Capital Market Association (2019), "Green Bond Principles (GBP)", <https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/>

⁹ Loan Market Association (2018), "Green Loan Principles", https://www.lma.eu.com/application/files/9115/4452/5458/741_LM_Green_Loan_Principles_Booklet_V8.pdf

¹⁰ Novethic (2018), "The European Green Funds Market 2018", https://www.novethic.com/fileadmin/user_upload/tx_ausynovethicetudes/pdf_complets/Novethic_2018_European-Green-Funds-Market_SustainableFinance.pdf

¹¹ <https://www.gsam.com/responsible-investing/en-INT/professional/insights/articles/green-bonds-connecting-fixed-income-capital-to-the-global-climate-transition>

2013: Vasakronan, Sweden's largest real estate company, issued the first corporate green bond.

2013: The state of Massachusetts issued the first US municipal green bond.

2014: ICMA published the Green Bond Principles.

2015: The People's Bank of China issued its own green bond guidelines.

2015: The United Nations adopted the Sustainable Development Goals (SDGs), a 15-year action plan for protecting the environment, ending poverty, and reducing inequality.

2016: Poland issued the world's first sovereign green bond.

2016: Apple issued a \$1.5 billion green bond, which was the largest green bond to be issued by a US company at the time.

2017: France issued a €7 billion debut green bond.

2017: Fiji became the first emerging market country to issue a sovereign green bond.

2017: The Association of Southeast Asian Nations (ASEAN) Capital Markets Forum developed green bond standards tailored to meet the needs and commitments of their own market.

2021: The UK and Colombia issued inaugural green sovereign bonds.

2021: The European Union raised €12 billion through green bonds as part of its NextGenerationEU program.

2021: Walmart issued a \$2 billion green bond in the US dollar market, the largest corporate green bond at the time.

2022: Canada entered the market with its inaugural C\$5 billion green bond.

2022: Singapore made its market debut with a \$2.4 billion green bond with a 50-year maturity, making it the longest-dated green bond issued by a sovereign.

3. Global Green Bond Activity (2021, Q3 2022 and 2022)

2021 Global Green Bond Market Overview¹²







Based on annual figures provided by Climate Bonds Initiative¹³, global green bond issuance reached \$522.7bn in 2021, increased by 75%, compared to 2020 levels of \$298.1bn. This lifted the cumulative total to \$1.6tn.

¹² https://www.climatebonds.net/files/reports/cbi_global_sotm_2021_02h_0.pdf

¹³ The Climate Bonds Initiative is an international investor-focused not-for-profit organisation working to mobilise the \$100tn bond market for climate change solutions. The mission is to help drive down

The green debt market returned to rapid growth, with volumes increasing by 75% yoy. The green theme continued to attract new issuers and included a total of 839 issuers during the year. The average size of individual green bonds rose by more than 50% to reach 250\$m. The addition of developed market (DM) sovereign bonds from new and existing issuers no doubt contributed to that growth.

Table 2: Green bond market score card

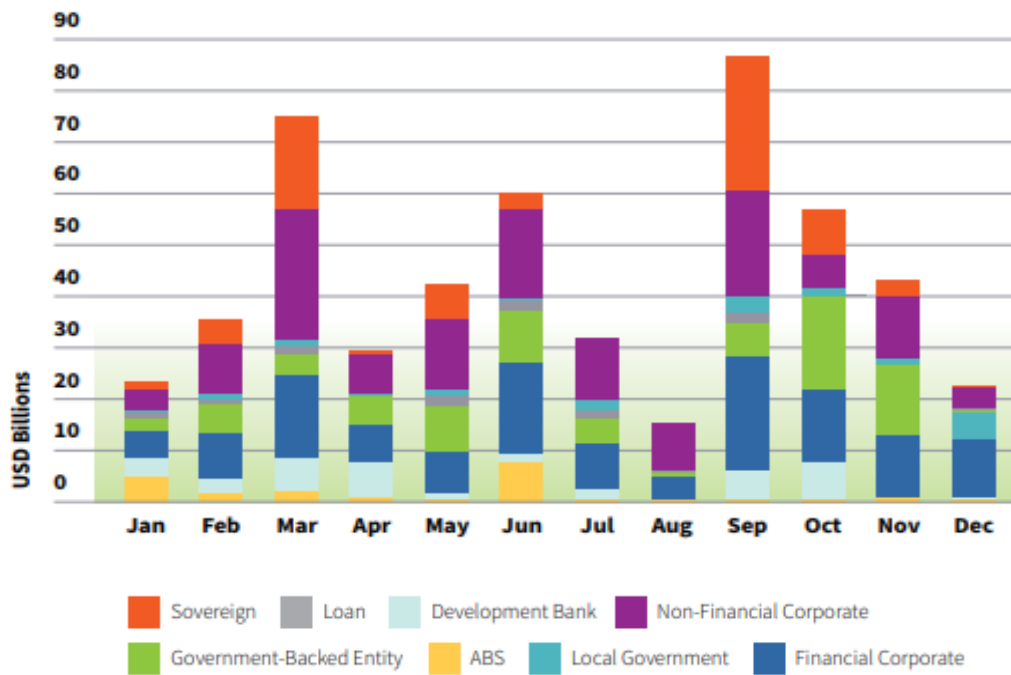
	2021	2020	Percent change YOY
Size of market	USD522.7bn	USD298.1bn	 75%
Number of issuers	839	636	 32%
Number of instruments	2,089	1,749	 19%
Average size of instrument	USD250m	USD165m	 51%
Number of countries	58	56	 3.5%
Number of currencies	33	34	 -3%

Source: Climate Bond Initiative

Rising inflation persisted driven by the post-COVID-19 economic recovery and higher energy prices. Issuers were keen to fund upcoming liabilities while interest rates remained low, and September was the most prolific month in the history of the green bond market (USD86bn).

Figure 3: September 2021 was the busiest month on record for green bonds

the cost of capital for large-scale climate and infrastructure projects and to support governments seeking increased capital markets investment to meet climate goals.



Source: Climate Bond Initiative

The Sovereign Green Bond Club continued to expand its membership. Eleven countries added 72.8\$bn with new bonds or taps; Italy, the UK, Serbia, Spain, and South Korea issued debut sovereign green bonds. In addition, in 2021 private sector issuers returned to the green bond market in force. There was extraordinary growth from emerging market (EM) financial and non-financial corporate issuers.

The most aggressive yoy growth in the region came from financial corporate (136%) and sovereign (103%) issuer types. Six European countries added sovereign volumes in 2021, including four debut issuers, and taps from three countries.

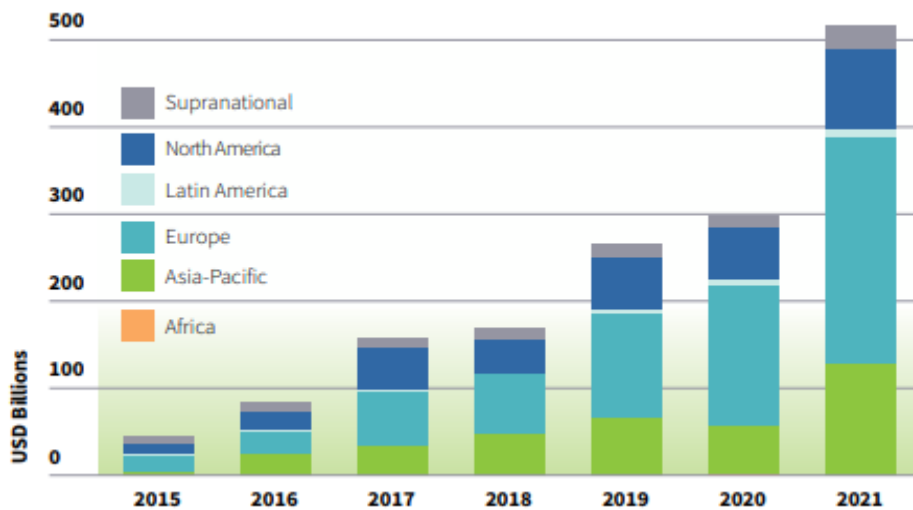
Regions and Countries

Three quarters (73%) of the 2021 green bond volume originated from developed markets (DM), while 21% came from emerging markets (EM) and just 4% was issued by supranational issuers (SNAT).

Half of the 2021 green bond volumes originated in Europe which contributed 265\$bn (50%) to the total. Asia-Pacific became the second most prolific region for green bonds reaching a cumulative total of 371.7\$bn by year end. A third of the cumulative Asia-Pacific green bond issuance was added in 2021 (129.5\$bn). North America fell one spot to third place with cumulative green bond issuance of 343\$bn. The 2021 annual figure of 92\$bn was 55% larger than the 60\$bn recorded for the prior year, helped by stronger policy messaging and

prevailing low rates. SNAT issuers were the fourth largest source of green bonds with the cumulative total reaching 120.7\$bn at the end of 2021. Annual volumes doubled to 27.3\$bn from 2020, and the increase can be explained by one bond: the green debut from the European Union (EU) worth 13.9\$bn.

Figure 4: Issuance by Region: Europe Drives 2021 Growth

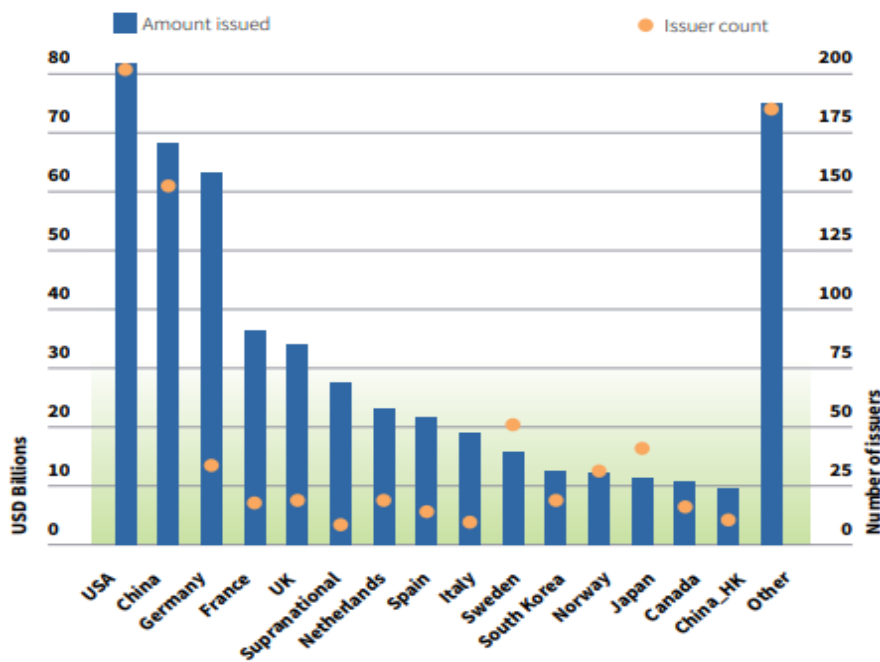


Source: Climate Bonds Initiative

As for countries, the USA maintained its position as the most prolific source of green bonds. Volumes increased by 63% to 81.9\$bn from 50.3\$bn in 2020. The cumulative total stands at 304\$bn, which is 50% larger than China, the next largest country source (199\$bn).

The US green bond market has been characterised by a relatively high number of issuers bringing smaller deals. In 2021, 204 issuers came to the market with the average sized deal increasing to 100\$m from 70\$m in 2020.

Figure 5: Top 2021 Countries: Amount Issued – Number of Issuers



Source: Climate Bonds Initiative

China bounced back from a shaky 2020 (23.8\$bn) with an almost threefold increase in volumes (68.1\$bn) and almost two and a half times the number of securities (268 in 2021, 109 in 2020). The most aggressive growth occurred in the non-financial corporate space, as volumes grew fivefold to 31.2\$bn. Meanwhile, Chinese ABS evaporated to a single bond in 2021 after 17 deals in 2020.

Germany's annual green bond volumes increased by 49% on the year to 63.2\$bn, helped by strong growth in financial corporates. Deutsche Bank priced 48 green bonds with a combined size of 10.6\$bn. The German government doubled down on its commitment to the green bond market with two new bonds worth almost 11.5b\$bn. Germany now has a total of four sovereign green bonds.

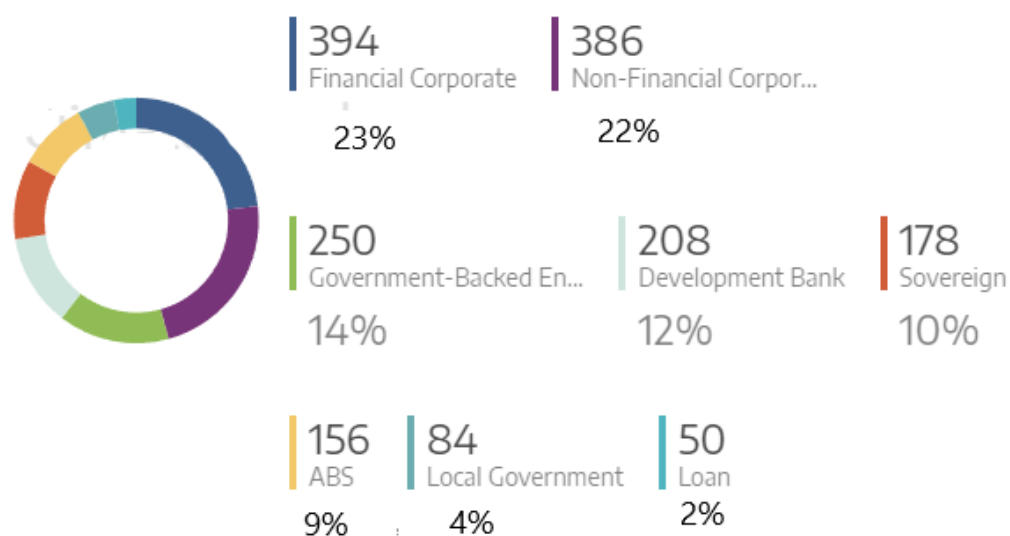
France consolidated its policy leadership position with its second sovereign green bond which by the end of the year was 13\$bn. Total issuance originating from France was broadly static on the year at 36\$bn down from 37\$bn in 2020.

Issuer Types

Private sector issuance recovered in 2021 with strong growth coming from financial corporate (143%) and non-financial corporate (111%) issuers. At the end of 2021, these two issuer types together represented 44% of cumulative green bond volumes.

Sovereigns also experienced triple digit growth of 111% on the period, and now contributes 10% to cumulative volumes. The UK provided 30% of the sovereign green bond supply as it supported its COP-26 hosting duties with a pair of green bonds worth 21\$bn. Four other issuers joined the sovereign green bond club during 2021: Spain (5.9\$bn), Italy (10\$bn), South Korea (812\$m) and Serbia (500\$m).

Figure 6: Green Bonds amounts issued globally by type of issuer (\$bn), 2021



Source: Climate Bonds Initiative

Financial corporates reversed the supply contraction of 2020 (55\$bn), to come back with green bonds reaching 135\$bn in 2021. A third of the total came from China (17%) and Germany (16%) combined. Among the 31 Chinese issuers, China Development Bank (6.5\$bn) and ICBC (4.5\$bn) issued the largest green bond volumes in 2021.

Non-financial corporates ended 2021 as the largest issuer type based on cumulative volumes which topped 361\$bn. In 2021, 328 issuers printed 540 green bonds totalling 140.6\$bn. Chinese state-owned company China Three Gorges Corporation was the largest issuer, pricing 18 green bonds with a combined value of 7.2\$bn. Among the top ten non-financial corporate issuers, two stand out as bringing much needed diversity to the green bond market. American multinational Mondelez made its debut with a trio of green bonds worth USD2.4bn while high

yield issuer Ford Motor Co finally came to the market with its first green bond worth USD2.5bn.

Table 3: Top green corporate issuers, 2021

Issuer Name	2021		Cumulative totals	
	USDbn	Number of green bonds	USDbn	Number of green bonds
China Three Gorges Corp	7.2	18	9.2	23
Iberdrola	3.3	3	16.4	21
CTP Group	3.0	3	4.2	5
Ardagh Group	2.8	4	2.8	4
Engie SA	2.6	3	16.9	14
Ford Motor Co.	2.5	1	2.5	1
EDP	2.4	3	2.4	3
State Grid Corporation of China	2.4	3	2.4	3
Mondelez International	2.4	3	2.4	3
Liberty Global	2.3	3	2.3	3

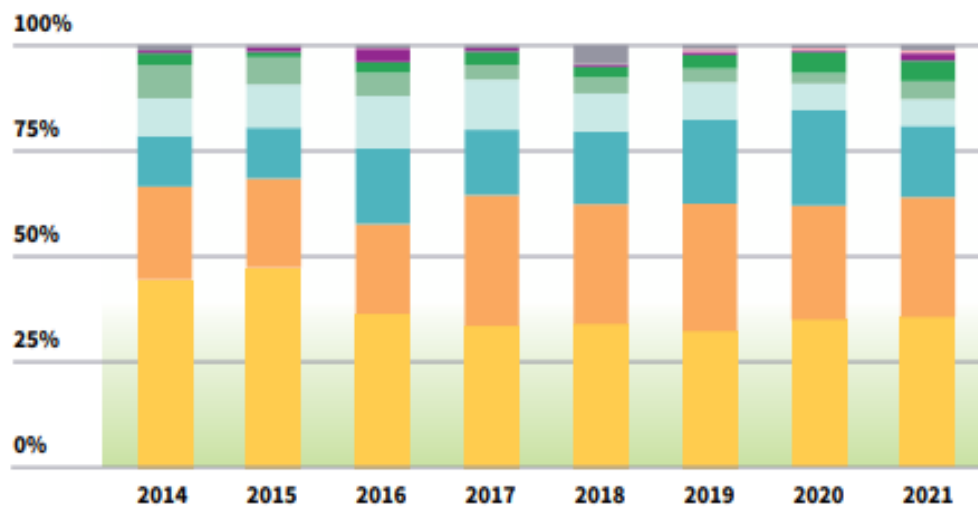
Source: Climate Bonds Initiative

Use of Proceeds (UoP)

Energy, Buildings, and Transport were the three largest UoP categories, collectively contributing 81% to the 2021 total. This is nevertheless a drop versus the record 85% in 2020. All UoP categories exhibited growth yoy, ranging from 824% in Industry to 31% in Transport.

Non-financial corporate issuers were the strongest supporters of Energy and Transport providing 40% and 27% of the total capital, respectively, while Buildings received most support from financial corporates (37.5%). Allocations to Industry UoP increased from just 1\$bn in 2020, to 9.1\$bn in 2021. Industry was earmarked as a UoP category in 32 deals including sovereign deals from the UK, Serbia, and Hong Kong, and the EU green bond.

Figure 7: Use of Proceeds allocation by category, 2014 - 2021



Source: Climate Bonds Initiative

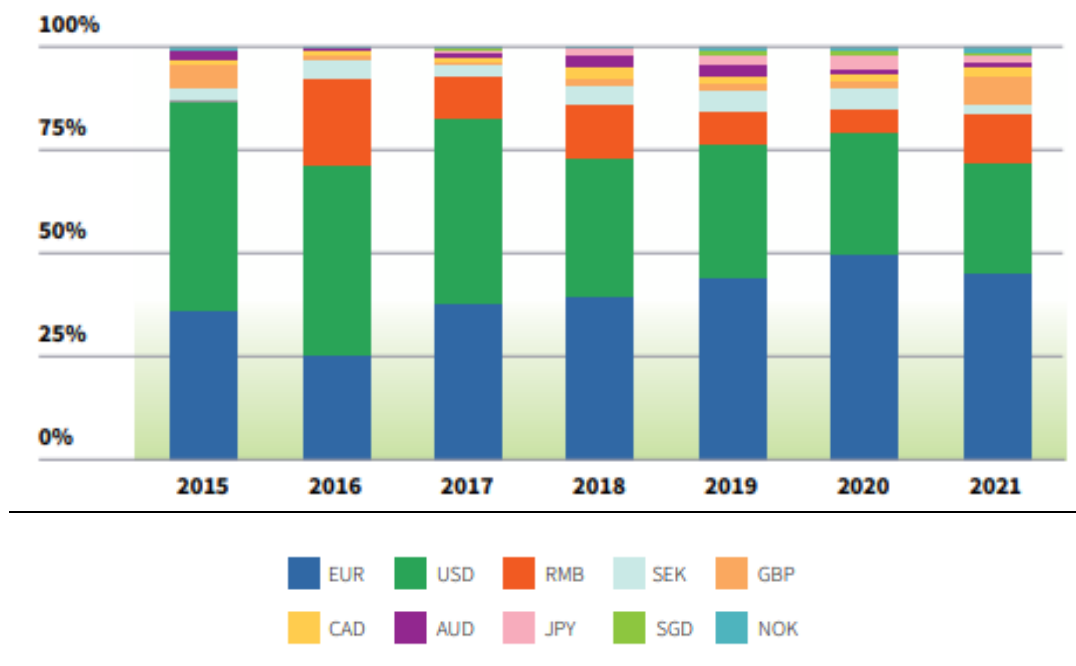
Currency

Euro was the preferred currency in terms of volume, and number of international issuers (36). However, the number of issuers at 408 was under half of those issuing in USD. Most (96%) of the bonds issued in USD originated domestically, while 81% of bonds issued in EUR originated from issuers using EUR as their official currency. The European green bond market is the most developed in the world, being the source of numerous dedicated investment mandates, and the most advanced policy measures. Where practicable, issuers prefer to issue in EUR to obtain maximum investor diversification.

Hard currencies were the source of 82% of green bond issuance in 2021, a 3% decline on the prior year. Issuance in the soft currencies increased by 102% largely because of the rebound in RMB issuance which reached 58.7\$bn from 17.4\$bn in 2020.

The number of currencies remained static at 33. The share of the top three currencies EUR (43%), USD (26%), and RMB (USD58.7bn) remained similar to the prior year (81%). The amount of EUR issuance in 2021 (226.7\$bn) exceeded that of EUR and USD put together in 2020 (225.6\$bn).

Figure 8: Percentage of green bond issued per currency, 2015 - 2021



Source: Climate Bonds Initiative

Q3 2022 market highlights

Cumulative green bond issuance reached 2\$tn in Q3 2022. This green milestone unites with the rising crop of sustainable bond labels (social, sustainability, sustainability-linked and transition), to reach a combined lifetime 3.5 \$trillion volume at end of the Q3. The news comes as Climate Bonds calls for the market to scale labelled issuance to a volume of 5\$trillion per year by 2025 to fight climate collapse, which looms large after years of inaction.

Table 4: GSS+ scorecard

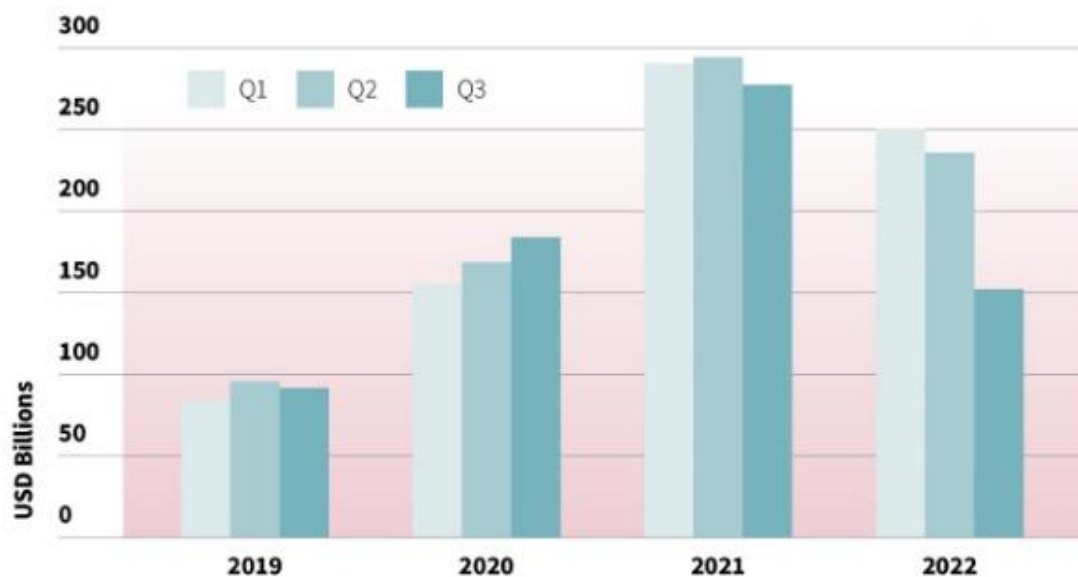
	Q3 2022		2022 YTD		Cumulative since 2006	
	USDbn	% total	USDbn	% total	USDbn	% total
Green	79.4	52.1	332.5	52.3	2008.1	57.2
Social	23.1	15.2	94.2	14.8	617.0	17.6
Sustainability	34.4	22.6	142.1	22.4	678.9	19.3
SLB	14.7	9.6	63.5	10.0	192.9	5.5
Transition	0.7	0.5	3.4	0.4	12.7	0.4
Total	152.3	100	635.7	100	3509.6	100

Source: Climate Bonds Initiative

The geopolitical tensions and rising inflation that have emerged this year have stunted the global bond market and contributed to a drop in issuance across the board. In 2021, a record year for GSS+ issuance, labelled debt constituted 5% of all debt issued. Though 2022 has seen a decrease in global bond volumes, the share of GSS+ issuance has remained unchanged from the 2021 contribution. It is hoped that labelled debt, which has consistently drawn strong investor appetite from the market, can offer resilience in trying economic circumstances.

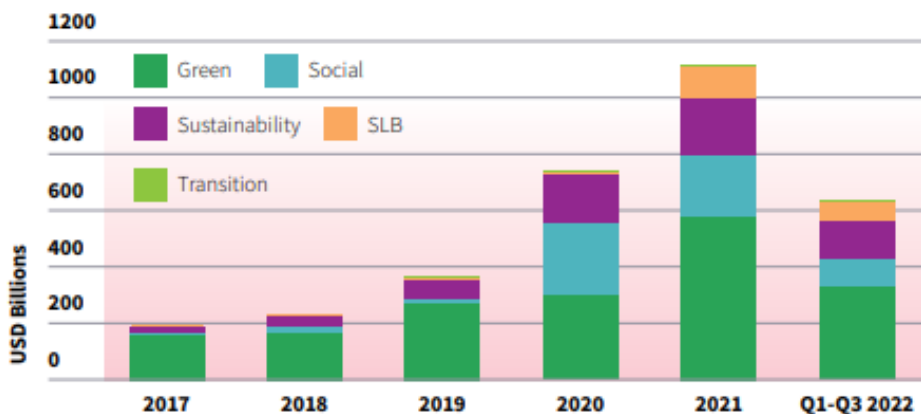
The total green, social, sustainability, sustainability-linked (SLB) and transition bond (GSS+) volumes reached 152.3\$bn in Q3 2022, a decline of 35% compared to Q2 2022, and 45% compared to Q3 2021. Year-to-date volumes of GSS+ debt had reached 635.7\$bn by the end of Q3. More than half of the total (52%, 332.5\$bn) came from green bonds. Sustainability bonds supplied 22.4% (142.1\$bn), social 14.8% (94.2\$bn), SLBs 10% (63.6\$bn), and transition comprised the smallest share at 0.5% (3.4\$bn).

Figure 9: GSS+ volumes per quarter, 2019 - 2022



Source: Climate Bonds Initiative

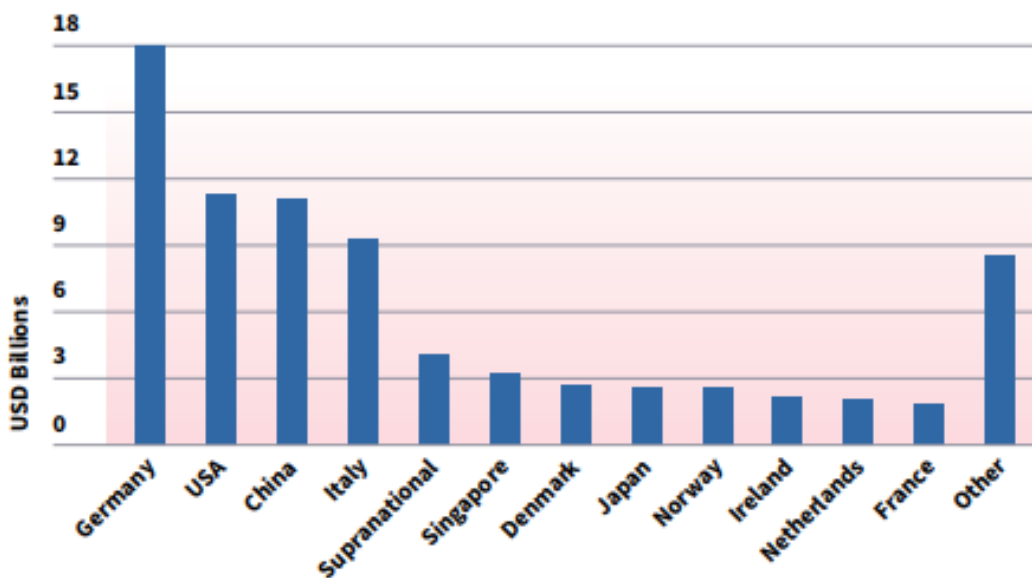
Figure 10: GSS+ volumes issued per year, 2017 – Q1/Q3 2022



Source: Climate Bonds Initiative

German development bank KfW was the largest of the nonsovereign Green Bond issuers in Q3 2022, raising a total of 4.3\$bn. The majority of that came from a 4 €bn (4.1\$bn) 7-year deal, and smaller amounts were issued in HUF and HKD, while a CNY bond was reopened. By the end of September, Climate Bonds had recorded 2022 green volumes of USD8.3bn from KfW, making it the third largest green bond issuer of 2022 after the European Union (USD17.3bn) and the European Investment Bank (EIB) (USD9.6bn).

Figure 11: Largest source of green bonds, Q3 2022



Source: Climate Bonds Initiative

Table 5: Q3 2022 non-sovereign green bond issuers

Largest green bond issuers Q3	Country	USD added to relevant database in Q3
KfW	Germany	4.3bn
EIB (European Investment Bank)	Supranational	4.0bn
General Motors	USA	2.3bn
Orsted AS	Denmark	2.0bn
Amprion GmbH	Germany	1.8bn

Source: Climate Bonds Initiative

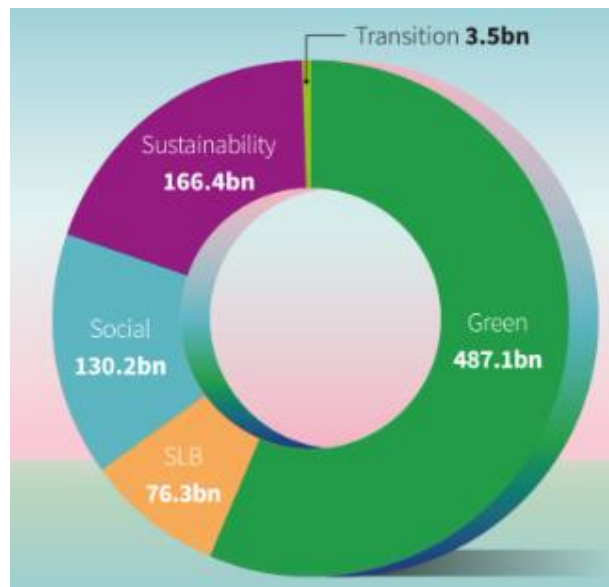
2022 highlights¹⁴

Climate Bonds' Market Intelligence has revealed Green, Social, Sustainability, Sustainability-linked (SLBs) and transition bonds (GSS+) issuance held its market share despite a difficult year for fixed-income markets, in which GSS+ volumes fell year-on-year for the first time in a decade.

In 2021, the share of GSS+ issuance reached record volumes of over \$1trillion and held a 5% share of the global bond market. However, challenging macroeconomic factors witnessed in 2022 have contributed to a drop in debt volumes across the board. 2022 saw GSS+ issuance hold its 5% share of the global bond market despite the tough terrain leading volumes to fall to 863.4\$bn.

As has been the case for several years now, green bonds accounted for the lion's share of total issuance. Green bonds, used to raise funding to support environmentally sustainable initiatives, accounted for just over half of the \$863.4bn issued in 2022 – \$487.1bn. Sustainability bonds contributed 166.4\$bn, social bonds totaled 130.2\$bn, SLBs saw 76.3\$bn, whilst transition bonds saw just 3.5\$bn.

¹⁴ 2022 Market Snapshot: And 5 big directions for sustainable finance in 2023, <https://www.climatebonds.net/2023/01/2022-market-snapshot-and-5-big-directions-sustainable-finance-2023>

Figure 12: Sustainable debt issuance in 2022

Source: Climate Bonds Initiative

The GSS issuance decline is attributed to a general decrease in bond issuances in most major markets amid what is now being called the ‘polycrisis’ or ‘permacrisis’, where macroeconomic trends have been compounded by geopolitical instability and supply chain disruption. “Lenders were left reluctant to lock-in high-credit rates as the fixed-income landscape shifted, squeezing supply that historically has been outstripped by heavy investor demand,” the Climate Bonds Initiative said in a statement.

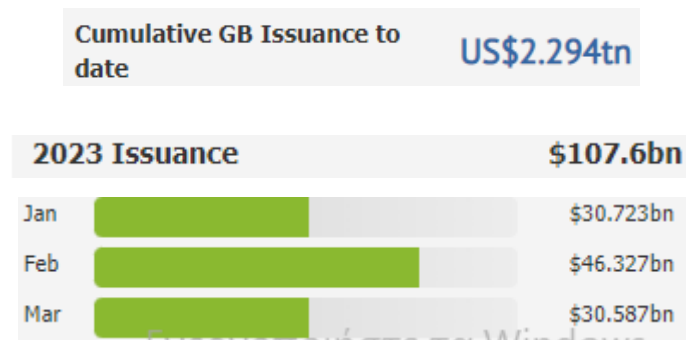
2023 – What Lies Ahead

The Climate Bonds Initiative is predicting a “stellar year” for green, social and sustainability-linked bond issuance in 2023, with green bonds likely to account for an even greater proportion. This has been partly attributed to the continued development of net-zero targets for mid-century, which now cover 91% of global GDP. Moreover, nations and regions are increasingly backing these targets with 2030 plans and, as such, need to scale green investment this decade.

As of March 2023, the cumulative green bond issuance reached 2.294\$trillion¹⁵.

¹⁵ <https://www.climatebonds.net/>

Figure 13: Green Bond Markets 2023



Source: Climate Bonds Initiative

However, Climate Bonds Initiative highlights that greater investment is needed this decade to prevent more macroeconomic volatility that makes bond issuance more challenging in the future. It warned that we are entering a new “age of volatility”, with the fallout of the pandemic and the ongoing war in Ukraine coming amid a time of extreme weather events that are more frequent and severe.

5 steps to 5 \$trillion¹⁶

Climate Bonds is pushing for at least 5\$tn in green bonds alone to be issued annually from 2025 onwards. Its recently published 5 steps to 5 trillion manifesto suggests five actions that we must take collectively to achieve this ambitious target.

1. Label Green

We must green the capital markets ecosystem by expanding this labelling to include all types of financial instruments from equities to short term borrowing, sectors, entities, and everything that comes beneath that including transition, resilience, nature-based solutions, and water. Liquidity and scale enable investors to commit to climate friendly investment mandates. At present, only a small fraction of the activities and participants contributing to green finance are being recognised. We need to identify what could qualify and include and

¹⁶ https://www.climatebonds.net/files/reports/cbi_5steps_to_5trillion_03d_0.pdf

celebrate all participants. Achieving this will enable the prioritisation of green activities and identification of green investment opportunities across all portfolios.

2. Define Transformation

We must expand our definitions to include areas beyond climate change mitigation. New areas requiring financing include transition, biodiversity, and adaptation and resilience including healthcare. Taxonomies that can be used by global investors seamlessly and with minimum transaction costs will facilitate global recognition of different green financial instruments.

3. Accelerate Policy

Governments must signal clear support for net-zero by initiating a supportive policy environment for transition. Endorsing clear transition pathways, establishing certainty of future demand for financeable climate solutions, and addressing risks in areas where the private sector is unable to act. Issuing sovereign green bonds indicates strong government leadership catalysing market creation and development through scale and issuers often obtain cheaper funding to boot. Climate Bonds 101 Sustainable Finance Policies for 1.5°C is full of suggestions to get policy moving.

4. Grow Pipeline

Creating a large, predictable and climate friendly pipeline of expenditures and projects is the key to achieving net zero. This requires ambitious planning, supportive policy, and leadership from the public sector through actions such as investment in research and development, and incorporating climate considerations into planning. Pipeline prioritisation, a pain point for all economies, can be bolstered by stronger definitions.

5. Boost Emerging Markets

Mechanisms to get capital flowing from richer to poorer such as blended finance to absorb junior capital tranches, de-risking guarantees, and larger sized deals, must all be multiplied. Economic development must build in mitigation from the start, and large projects should be financed through the capital markets to encourage dedicated investment.

4. Selection of Projects Funded Through Green Bonds




The eligible Green Project categories, listed in no specific order, include, but are not limited to:

- **renewable energy** (including production, transmission, appliances and products),
- **energy efficiency** (such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products),
- **pollution prevention and control** (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/emission-efficient waste to energy),
- **environmentally sustainable management of living natural resources and land use** (including environmentally sustainable agriculture, environmentally sustainable animal husbandry, climate smart farm inputs such as biological crop protection or drip-irrigation, environmentally sustainable fishery and aquaculture, environmentally-sustainable forestry, including afforestation or reforestation, and preservation or restoration of natural landscapes),
- **terrestrial and aquatic biodiversity conservation** (including the protection of coastal, marine and watershed environments),
- **clean transportation** (such as electric, hybrid, public, rail, non-motorised, multi-modal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions),
- **sustainable water and wastewater management** (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation),
- **climate change adaptation** (including information support systems, such as climate observation and early warning systems),
- **eco-efficient and/or circular economy adapted products, production technologies and processes** (such as development and introduction of environmentally sustainable products, with an eco-label or environmental certification, resource-efficient packaging and distribution),
- **green buildings** which meet regional, national or internationally recognised standards or certifications.

The Climate Bonds Taxonomy identifies the assets and projects needed to deliver a low carbon economy and gives GHG emissions screening criteria consistent with the 1.5 °C global warming limit set by the COP 21 Paris Agreement.

Table 6: Climate Bonds Taxonomy (as of 9/2022)

ENERGY	TRANSPORT	WATER	BUILDINGS	LAND USE & MARINE RESOURCES	INDUSTRY	WASTE	ICT
Solar	Private transport	Water monitoring	Residential	Agriculture Green Bond	Cement production	Preparation	Broadband networks
Wind	Public passenger transport	Water storage	Commercial	Agri-food transition finance	Steel production	Reuse	Telecommuting software and service
Geothermal	Freight rail	Water treatment	Products & systems for efficiency	Commodity supply chains	Basic Chemicals production	Recycling	Data hubs
Bioenergy	Aviation	Water distribution	Urban development	Commercial Forestry	Hydrogen production	Biological treatment	Power management
Hydropower	Water-borne	Flood defence		Ecosystem conservation & restoration	Mining of metals and minerals	Waste to energy	
Marine Renewables		Nature-based solutions			Fossil Gas Transition	Landfill	
Electrical Grids & Storage					Carbon Capture and Storage	Radioactive waste management	
Nuclear					Early coal phase out		

 Certification Criteria approved
 Criteria under development
 Due to commence

Source: Climate Bonds Initiative

5. Prospects for Issuing Green Bonds in SE Europe

In **SE Europe**, an issuance market for green bonds does not actually exist, with only a small number of private sector companies and financial institutions having issued green bonds, but there are great prospects as the region is moving towards decarbonization and RES and energy efficiency projects are constantly increasing.

Map 2 – SE Europe, as Defined by IENE



Source: IENE

A list of Green Bond issuers in Greece is presented below, followed by issuers in the other countries of SEE region.

1. TERNA ENERGY

Greece's TERNA Energy issued a seven-year €150mn green bond in October 2019¹⁷. EBRD invested **€18mn** in the green bond issuance, being the first certified climate bond that the EBRD is supporting in the country. Ernst & Young has verified that the bond meets the Climate Bonds Initiative's classification as a certified climate bond.

The investment is part of the EBRD's Greek Corporate Bonds Framework, developed to extend the Bank's support for the local corporate bond market and to strengthen its long-term viability. The funds will finance additional investments in renewable energy projects in Greece. The projects will also contribute to the country's target of increasing the share of renewable energy to 35% of its total energy consumption by 2030. In June 2017, the EBRD launched its original Greek Corporate Bonds Framework, which has successfully leveraged €760mn of

¹⁷ Aristeidou, O. (2019), "EBRD invests €18 million in TERNA ENERGY's green bond", *EBRD*, <https://www.ebrd.com/news/2019/ebrd-invests-18-million-in-terna-energys-green-bond.html>

listed bonds. A new framework, the €185mn Greek Corporate Bonds Framework II, was approved in June 2018, leveraging an additional €350mn to date.

TERNA Energy is the largest wind-electricity producer in Greece. It has 1,512 MW of renewable energy power plants in operation or under construction, primarily wind farms, located in Bulgaria, Greece, Poland and the United States of America.

2. ELLAKTOR GROUP

2019 was the year in which Greece's ELLAKTOR Group, taking into account the favorable conditions in the international capital markets, proceeded to the issuance of an international, green bond, with fixed rate without collateral, totaling **€670mn** over a five-year period. This was the largest high yield green bond in Europe for 2019 and the first high yield green bond in Greece. ELLAKTOR's bond recorded a wide participation from Europe, Asia and America, with more than 100 investors, of which 75% were foreign portfolios and only 25% of Greek origin¹⁸.

3. MYTILINEOS

MYTILINEOS S.A., a leading industrial and energy company with internationally diverse assets and operations announced on April 22, 2021 the successful pricing of its inaugural green bond offering of **€500.0 million** aggregate principal amount of 2.25% senior notes due 2026 (the "Notes"), at an issuance price of 100%. The proceeds from the Offering will be used (i) to repay certain existing indebtedness, (ii) for general corporate purposes, and (iii) to pay fees and expenses in connection with the Offering. An amount equivalent to the net proceeds from the Notes will be used to finance or refinance, in whole or in part, Eligible Green Projects (including other related and supporting expenditures) in accordance with the company's Green Bond Framework.¹⁹

4. NATIONAL BANK OF GREECE

¹⁸ ELLAKTOR Group (2020), "Ordinary General Meeting of the Shareholders of ELLAKTOR Group", https://ellaktor.com/wp-content/uploads/2020/09/PRESS-RELEASE-ORDINARY-GENERAL-MEETING-10.09.2020_EN.pdf

¹⁹ <https://www.mytilineos.com/news/company-news/mytilineos-s-a-announces-the-successful-pricing-of-its-inaugural-green-bond-offering-of-500-million-senior-notes-due-2026/>

NATIONAL BANK OF GREECE completed successfully the placement of a green senior bond in the Greek market in October 2020, totaling **€500 million**. The transaction also marks the first issue of a senior bond by a Greek bank since 2015. The bond matures in six years, and is callable in five years, with a coupon of 2.75% and a yield of 2.875%.

According to ICMA principles for green bonds, based on which the transactions was issued, NBG is contractually committed to channeling all the funds raised from the sale of the bond to financing projects related to the green economy. It should be noted that NBG already maintains a high share (40%) in the Renewable Energy Market market – a level that is expected to strengthen further.

The financing of projects in the energy sector, and above all in renewable energy, is a strategic goal of the bank, which targets financing of €3 billion over the next 3 years.

The transaction attracted the interest of a large part of the investor community, raising funds of circa €1.2 billion, with the participation of 80 – in their majority international – institutional investors. The success of the undertaking, reflecting demand by a broad investor base, is tangible confirmation of the confidence that NBG enjoys, and the general prospects for the Greek economy.²⁰

5. PIREAUS BANK

Piraeus Financial Holdings S.A. announced that its subsidiary Piraeus Bank S.A. (“Piraeus Bank”) has successfully completed the book building process for the issuance of a **€500 million** Green Senior Preferred Bond at a coupon of 3.875%, attracting the interest of a large number of institutional investors.

The Bond has a maturity of six years, an embedded issuer call option after five years and will be listed on the Luxembourg Stock Exchange’s Euro MTF market.

The issuance followed a two-day marketing period and received significant institutional investor support with an order book in excess of €850 million from more than 70 investors.²¹

²⁰ National Bank of Greece landmark issue of a €500m Green Senior Bond, <https://www.nbg.gr/en/group/press-office/reports/national-bank-of-greece-landmark-issue-of-a-500m-green-senior-bond-20527>

²¹ Piraeus Bank successfully priced its inaugural Green Senior Preferred Bond amounting to €500mn, <https://www.piraeusholdings.gr/en/press-office/announcement/2021/10/announcement-27-10-2021>

6. NOVAL PROPERTIES

The Company has issued a Green Bond Loan for a total amount of Euro 120 million, duration seven years, divided into 120,000 intangible, common, anonymous bonds with nominal value Euro 1,000 each.

Noval Property's green bond, which is listed on the Athens Stock Exchange, is aligned with the International Capital Market Association's (ICMA) Green Bond Principles, and will help strengthen corporate climate governance, while supporting transparency and integrity in the development of the local green capital market.

The issuance advances Noval Property's strategy to scale up by providing funding to pursue new investments and property developments, while diversifying its funding sources and restructuring its balance sheet.

7. Greek Government²²

Greece contemplates the issuance of an inaugural Green GGB (Greek Government Bond) sometime in 2023, to (i) support the implementation of its sustainability agenda and (ii) enhance PDMA's (Public Debt Management Agency) and achieving net-zero by 2050, as outlined in the May 2022 Climate Law. The implementation of Greece's sustainability strategy involves public investments that can be financed through the issuance of Green Bonds, as presented by the Minister of Finance at the UN's COP-26 (November 2021).

By issuing Greece's first Green sovereign bond, PDMA intends to:

- ✓ Align the State's financial policy with national sustainability targets, by further evidencing commitment to its sustainability agenda and by facilitating the monitoring of progresses made under Greece's ESG strategy (through regular reporting).
- ✓ Strengthen Greece's investor base, by addressing institutional investors' rising ESG standards, and by reaching out to new types of investors.

²² Hellenic Republic – Funding Strategy for 2023 (December 2022),

<https://www.pdma.gr/en/component/content/article/17-investor-relations-library/5158-funding-strategy-for-2023?Itemid=197>

- ✓ Stand at the forefront of Eurozone sovereign issuers, by joining the few Eurozone Member States already present on the sovereign Green bond market, and by anticipating the growing impetus of Credit Rating Agencies for environment-related assessment criteria.

Table 7: Key features of the contemplated Green GGB issuance

Format	Green GGB	Currency	EUR
Timing of issuance⁽¹⁾	H2 2023	Size⁽¹⁾	Benchmark size
Maturity⁽¹⁾	Medium to long-term <i>(complementary to the conventional GGB yield curve)</i>	Framework	Green Bond Framework <i>(under development, in line with EU and international best standards)</i>

Note: (1) Subject to market conditions

Source: Hellenic Republic

An overview of Green Bond issuers in SEE countries, other than Greece, follows.

Cyprus

S.S.H Solar Finance PLC (Issuer), a subsidiary of the Holding Company S.S.H. SCANDINAVIAN SOLAR PARKS HOLDING Ltd, intends by April 2023 to issue a green bond to fund the Group's green projects, where Group refers to S.S.H. Scandinavian Solarparks Holding Ltd and its subsidiaries.

To further enable the Holding Company to finance its operations and expand its solar park business portfolio, the Board of Directors has decided for the SSH Solar Finance Plc to issue a Green Bond within the Green Bond Framework aligned with the United Nations' Sustainable Development Goals.

S.S.H. Scandinavian Solarparks Holding Ltd is an independent power producer that develops, owns, and operates utility scale solar power generation plants. The Holding Company is licensed by Cyprus Transmission System Operator (CERA) as a to producer of electricity generated by Photovoltaic Parks.

The amount of Green Bonds issuance will be approximately 5 million euros.

IENE following an agreement with the Holding Company prepared the Verification Report which is necessary for the issuance of a Green Bond to be certified by Climate Bond Initiative (CBI), in accordance with the Climate Bond Standard and the Solar Criteria v2.1.

Romania

Raiffeisen Bank Romania (RBRO) has successfully placed on 14 May 2021 and 11 June 2021 the first two green bond issuances in local currency ever listed on the Bucharest Stock Exchange (BSE), the first with a total amount 81 million euro and the second issuance being the largest corporate bond placed and listed on BSE for an amount of 244 million euros²³.

Croatia

A sustainability bond was issued in 2022 by Raiffeisenbank Austria d.d. (RBA), the Croatian subsidiary of Austria's Raiffeisen Bank International AG, in a private placement of €200 million.

RBA became the first bank in Croatia to establish a sustainability bond framework, enabling it to issue both sustainability and green bonds in accordance with the International Capital Market Association's guidelines for sustainability bonds. This issue was the first sustainability bond ever issued by a bank in Croatia.

Serbia

In September 2021, the Republic of Serbia issued a 1-billion-euro sovereign green bond to finance the country's green agenda.

According to Serbia's Green Bond Framework, proceeds from Serbia's sovereign green bonds will be used for financing and refinancing in the areas of renewable energy (with emissions of up to 100 grams of carbon dioxide equivalent per kilowatt-hour), energy efficiency, sustainable water and wastewater management, pollution prevention and control and circular economy, protection of the environment and biodiversity and sustainable agriculture²⁴.

²³ Raiffeisen Bank Romania Green Bond Report,

<https://www.raiffeisen.ro/wps/wcm/connect/fbdf7b4-0418-4742-b1ba-f07321ba4539/RBRO-Green-Bond-Report-2022.pdf?MOD=AJPERES>

²⁴ <https://www.greenfinanceplatform.org/policies-and-regulations/serbia-issued-sovereign-green-bond>

Turkey

The first green bond in Turkey was issued in 2016 by Turkiye Sinai Kalkinma Bankasi (TSKB), with the USD 300 million raised to be used in energy, health, and education projects. The launch of the bond is considered a significant success since the bond demanded was 14 times more than expected. Following the first green bond, several other companies issued green bonds to finance their sustainability-linked projects. Moreover, after TSKB, Turkey's two biggest banks also issued green bonds to fund the construction of green buildings and renewable energy projects²⁵. Akbank issued the first Green Bond in the Turkish banking sector during the COVID-19 pandemic, which amounted to USD 50 million with a 4 year 110 days maturity²⁶.

6. Basic Parameters for a Successful Green Bond Issuance

The Green Bond Principles recommend a clear process and disclosure for issuers, which investors, banks, underwriters, placement agents and others may use to understand the characteristics of any given Green Bond. The Green Bond Principles emphasise the required transparency, accuracy and integrity of information that will be disclosed and reported by issuers to stakeholders.

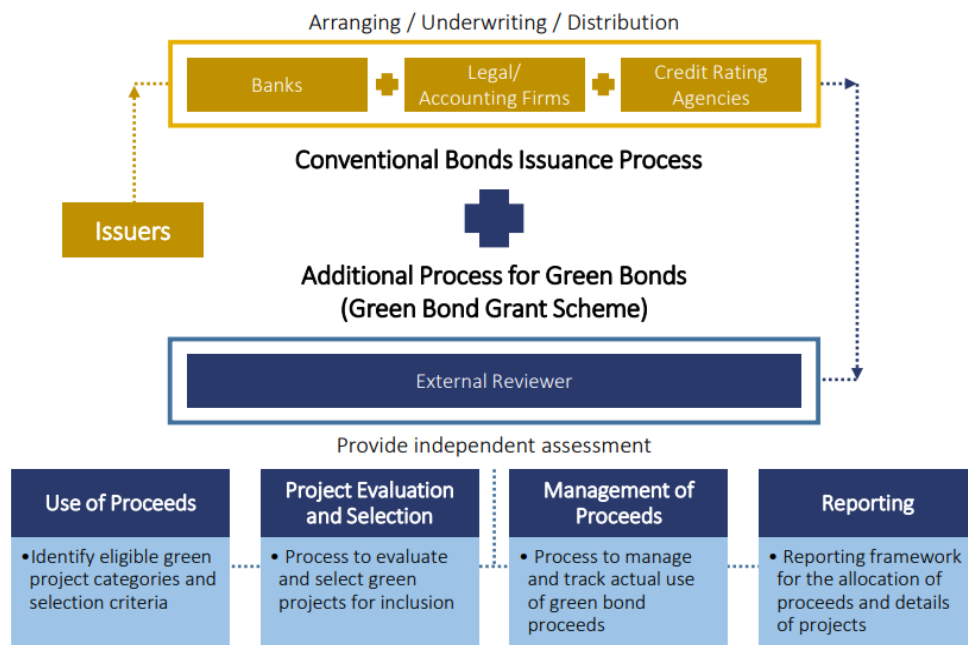
The Green Bond Principles have four core components:

1. Use of Proceeds
2. Process for Project Evaluation and Selection
3. Management of Proceeds
4. Reporting

²⁵ <https://ceelegalmatters.com/turkey/21403-the-rise-of-green-finance-in-turkey>

²⁶ <https://www.akbankinvestorrelations.com/en/news/detail/Akbank-becomes-the-first-Turkish-bank-to-issue-a-Green-Bond-during-COVID-19-pandemic/540/1283/0>

Figure 14 – How to Issue a Green Bond



Source: Climate Bonds Initiative

Concerning the role of External Reviewer, as shown in Figure 10, this also covers Advisory and Compliance services provided by specialized consultants such as IENE (see Section 9 of the present Report).

1. Use of Proceeds

The cornerstone of a Green Bond is the utilisation of the proceeds of the bond for Green Projects, which should be appropriately described in the legal documentation for the security. All designated Green Projects should provide clear environmental benefits, which will be assessed and, where feasible, quantified by the issuer.

In the event that all or a proportion of the proceeds are or may be used for refinancing, it is recommended that issuers provide an estimate of the share of financing vs. re-financing, and where appropriate, also clarify which investments or project portfolios may be refinanced, and, to the extent relevant, the expected look-back period for refinanced Green Projects.

The Green Bond Principles explicitly recognise several broad categories of eligibility for Green Projects (see Figure 14), which contribute to environmental objectives such as climate change mitigation, climate change adaptation, natural resource conservation, biodiversity conservation, and pollution prevention and control.

While the purpose of Green Bond Principles is not to take a position on which green technologies, standards, claims and declarations are optimal for environmentally sustainable benefits, it is noteworthy that there are several current international and national initiatives to produce taxonomies, as well as to provide mapping between them to ensure comparability. This may give further guidance to Green Bond issuers as to what may be considered green and eligible by investors. These taxonomies are currently at various stages of development.

Furthermore, there are many institutions that provide independent analysis, advice and guidance on the quality of different green solutions and environmental practices. Definitions of green and green projects may also vary depending on sector and geography.

2. Process for Project Evaluation and Selection

The issuer of a Green Bond should clearly communicate to investors:

- the environmental sustainability objectives
- the process by which the issuer determines how the projects fit within the eligible Green Projects categories identified above
- the related eligibility criteria, including, if applicable, exclusion criteria or any other process applied to identify and manage potentially material environmental and social risks associated with the projects.

Issuers are encouraged to position this information within the context of the issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability. Issuers are also encouraged to disclose any green standards or certifications referenced in project selection. The Green Bond Principles encourage a high level of transparency and recommend that an issuer's process for project evaluation and selection be supplemented by an external review.

3. Management of Proceeds

The net proceeds of the Green Bond, or an amount equal to these net proceeds, should be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer in an appropriate manner, and attested to by the issuer in a formal internal process linked to the issuer's lending and investment operations for Green Projects.

So long as the Green Bond is outstanding, the balance of the tracked net proceeds should be periodically adjusted to match allocations to eligible Green Projects made during that period.

The issuer should make known to investors the intended types of temporary placement for the balance of unallocated net proceeds.

The Green Bond Principles encourage a high level of transparency and recommend that an issuer's management of proceeds be supplemented by the use of an auditor, or other third party, to verify the internal tracking method and the allocation of funds from the Green Bond proceeds.

4. Reporting

Issuers should make, and keep, readily available up to date information on the use of proceeds to be renewed annually until full allocation, and on a timely basis in case of material developments. The annual report should include a list of the projects to which Green Bond proceeds have been allocated, as well as a brief description of the projects and the amounts allocated, and their expected impact. Where confidentiality agreements, competitive considerations, or a large number of underlying projects limit the amount of detail that can be made available, the Green Bond Principles recommend that information is presented in generic terms or on an aggregated portfolio basis (e.g. percentage allocated to certain project categories).

Transparency is of particular importance in communicating the expected impact of projects. The Green Bond Principles recommend the use of qualitative performance indicators and, where feasible, quantitative performance measures (e.g. energy capacity, electricity generation, greenhouse gas emissions reduced/avoided, number of people provided with access to clean power, decrease in water use, reduction in the number of cars required, etc.), and disclosure of the key underlying methodology and/or assumptions used in the quantitative determination. Issuers with the ability to monitor achieved impacts are encouraged to include those in their regular reporting.

Voluntary guidelines aiming at a harmonized framework for impact reporting exist for energy efficiency, renewable energy, water and wastewater projects, and waste management projects. The guidelines include templates for the format of impact reporting at a project and at a portfolio level that issuers can adapt to their own circumstances. The Green Bond Principles encourage further initiatives, to help establish additional references for impact reporting that others can adopt and/or adapt to their needs. Guidelines for additional sectors are under development. The use of a summary reflecting the main characteristics of a Green

Bond or a Green Bond programme and illustrating its key features in alignment with the four core components of the Green Bond Principles may help inform market participants.

External Review

It is recommended that in connection with the issuance of a Green Bond or a programme, issuers appoint (an) external review provider(s) to confirm the alignment of their bond or bond programme with the four core components of the Green Bond Principles as defined above. There is a variety of ways for issuers to obtain such outside input to their Green Bond process and there are several levels and types of review that can be provided to the market.

An issuer can seek advice from consultants and/or institutions with recognised expertise in environmental sustainability or other aspects of the issuance of a Green Bond. It may cover areas such as the establishment of an issuer's Green Bond framework or the reporting of a Green Bond issuer. Consultancy or advisory services entail collaboration with the issuer and differ from independent external reviews. The Green Bond Principles encourage independent review of environmental features of the (types of) assets or activities associated with the Green Bond or Green Bond programme, where applicable.

Independent external reviews may vary in scope and may address a Green Bond framework/programme, an individual Green Bond issue, the underlying assets and/or procedures. They are broadly grouped into the following types, with some providers offering more than one type of service, either separately or combined:

- 1. Second Party Opinion:** An institution with environmental expertise that is independent from the issuer may issue a Second Party Opinion. The institution should be independent from the issuer's adviser for its Green Bond framework, or appropriate procedures, such as information barriers, will have been implemented within the institution to ensure the independence of the Second Party Opinion. It normally entails an assessment of the alignment with the Green Bond Principles. In particular, it can include an assessment of the issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability, and an evaluation of the environmental features of the type of projects intended for the Use of Proceeds.

- 2. Verification:** An issuer can obtain independent verification against a designated set of criteria, typically pertaining to business processes and/or environmental criteria. Verification may focus on alignment with internal or external standards or claims made by the issuer. Also, evaluation of the environmentally sustainable features of underlying assets may be termed verification and may reference external criteria. Assurance or attestation regarding an issuer's internal tracking method for use of proceeds, allocation of funds from Green Bond proceeds, statement of environmental impact or alignment of reporting with the Green Bond Principles, may also be termed verification.
- 3. Certification:** An issuer can have its Green Bond or associated Green Bond framework or Use of Proceeds certified against a recognised external green standard or label. A standard or label defines specific criteria, and alignment with such criteria is normally tested by qualified, accredited third parties, which may verify consistency with the certification criteria.
- 4. Green Bond Scoring/Rating:** An issuer can have its Green Bond, associated Green Bond framework or a key feature such as Use of Proceeds evaluated or assessed by qualified third parties, such as specialised research providers or rating agencies, according to an established scoring/rating methodology. The output may include a focus on environmental performance data, the process relative to the Green Bond Principles, or another benchmark, such as a 2-degree climate change scenario. Such scoring/rating is distinct from credit ratings, which may nonetheless reflect material environmental risks.

An external review may be partial, covering only certain aspects of an issuer's Green Bond or associated Green Bond framework or full, assessing alignment with all four core components of the Green Bond Principles. The Green Bond Principles take into account that the timing of an external review may depend on the nature of the review, and that publication of reviews can be constrained by business confidentiality requirements.

The Green Bond Principles encourage external review providers to disclose their credentials and relevant expertise and communicate clearly the scope of the review(s) conducted. Voluntary Guidelines for External Reviewers have been developed by the Green Bond Principles to promote best practice. The Guidelines are a market-based initiative to provide information and transparency on the external review processes for issuers, underwriters, investors, other stakeholders and external reviewers themselves.

Climate Bonds Standard and Certification Scheme

The Climate Bonds Standard and Certification Scheme is a labelling scheme for bonds, loans and other debt instruments. Rigorous scientific criteria ensure that it is consistent with the goals of the Paris Climate Agreement to limit warming to under 2 degrees. The Scheme is used globally by bond issuers, governments, investors and the financial markets to prioritise investments which genuinely contribute to addressing climate change. Climate Bonds Standard is designed as an easy-to-use tool for investors and issuers to assist them in prioritising investments that truly contribute to addressing climate change. The Standard is a public good resource for the market.

The Climate Bonds Standard is made up of two parts: (i) the parent standard detailing management and reporting processes and (ii) a suite of sector Criteria detailing the requirements assets must meet to be eligible for certification. The Certification Scheme requires issuers to obtain independent verification, pre- and post-issuance, to ensure the bond meets the requirements of the Climate Bonds Standard.

Sector specific Criteria or definitions of green are developed by Technical Working Groups (TWG), made up of scientists, engineers and technical specialists. Draft Criteria are presented to Industry Working Groups before being released for public comment. Criteria are presented to the Climate Bonds Standard Board for approval.

Figure 15 – Certification Process for a Bond, Loan or Other Debt Instrument



Source: Climate Bonds Initiative

Figure 16 – Governance of the Climate Bond Standard



Source: Climate Bonds Initiative

7. Who Can Issue a Green Bond?

Any entity with bonding authority may issue Green Bonds, including private companies, financial institutions or governments. According to the Climate Bond Initiative, as of 2018, 145 entities in Europe have issued Green Bonds. These include:

- **Private companies:** Non-financial corporations, particularly energy and utility companies, finance specific environmental projects through Green Bonds issuance. Such issuances allow investors to know their investments are going to green solutions, as companies issuing Green Bonds obligate themselves to ring-fence the proceeds to specific, previously-outlined projects.
- **Financial institutions:** Commercial, investment and development banks can all issue Green Bonds. Such issuances signal the companies' commitment to sustainable development.
- **Municipalities and national governments:** Government entities can issue Green Bonds as a means to finance specific local projects or meet selected environmental targets. For municipalities, Green Bonds are a sure way to engage local stakeholders into financing sustainable solutions, while for national governments, sovereign Green

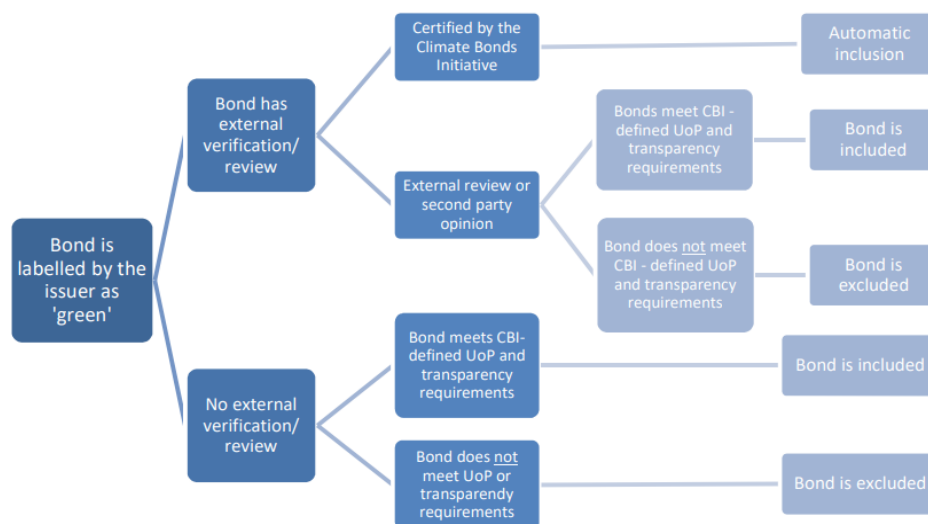
Bonds aid in carrying out sustainable policy agendas and stimulate the flow of private capital investments.

The Green Bonds issuance should follow the aforementioned process.

8. Criteria for Issuing a Green Bond

The Climate Bonds Initiative uses a clear set of criteria to define green bonds for inclusion in its Green Bond Database. The four-step process to classify a green bond as eligible includes identification of environmentally themed bonds, reviewing eligible bond structures, evaluating the use of proceeds and screening eligible green projects or assets for adherence with the Climate Bonds Taxonomy²⁷.

Figure 17 – Green Bond Methodology



Source: Climate Bonds Initiative

Process²⁸

1. Identification of green themed (self-labelled) bonds

The issuer of a green bond must declare that the bond is intended to be environmentally beneficial through labelling the bond. The label is most commonly 'green' however other

²⁷ <https://www.climatebonds.net/standard/taxonomy>

²⁸ The Process describes the market screening for inclusion in the green bond database.

labels such as climate-awareness, climate, environmental, carbon, sustainability and ESG (Environment, Social and Governance) are also eligible.

The issuer must use the label or description in a public document for the label to be valid. For example, the label can be used in reference to the bond in a press release from the issuer, statement on the issuers' website, the bond prospectus or supporting bond offering documents.

2. Eligible bond structures

The eligible bond structures are divided into asset-linked and asset-backed structures. Asset linked or use of proceeds bonds have earmarked proceeds from the bond sale for eligible projects. Some issuers of asset-linked bonds may choose to ring-fence proceeds through the use of separate accounts or vehicles. Ring-fencing is not an explicit requirement for inclusion, but proceeds must be at least earmarked for eligible green projects.

For asset-backed structures, bonds are divided into Project Bonds and Securitised Bonds.

- Project Bonds are eligible in case they are backed by a green project and the proceeds from bond sale are used solely to finance that same green project;
- Securitised Bonds are eligible if proceeds go towards green projects or assets. Thereby, collateralized assets must not be labelled as 'green'.

3. Transparency on the use of green bond proceeds

Issuers must commit to use proceeds from the bond sale in full (lessor the bond arrangement fees) to finance eligible green projects or assets. If more than 5% of the proceeds are used for 'general corporate purposes' or projects that are not defined as green, the bond will not be eligible for inclusion. If proceeds are to be split across different projects, for example an ESG Bond with social projects and separate green projects, the bond would not be eligible.

4. Screening on green credentials

Each bond is reviewed based on the green credentials of use of proceeds. This may be:

- earmarked proceeds for asset-linked, senior unsecured bonds;
- projects backing a project bond or
- assets backing an ABS.

At issuance, the issuer must declare the types of eligible green assets or projects to be financed with the proceeds (in line with the Green Bond Principles).

Inclusions²⁹

Climate Bonds' market intelligence reviews the eligible asset types for green bonds using the definitions and criteria of the Climate Bonds Taxonomy. Bonds that are in line with the Taxonomy are included in their green bonds database.

Exclusions

Bonds that are not aligned with the taxonomy are excluded from the list. In case a green marked bond is selected for inclusion under the described criteria but cannot fulfill the criteria later on, it will be removed immediately and is not marked as green anymore.

Figure 18 – Sector Criteria Available for Certification



Source: Climate Bonds Initiative

²⁹ The Market Intel at Climate Bonds screens the markets for all bonds and according to the Methodology, then puts them in the Green Bond Database. Inclusion in Green Bond Database for any bond is after issuance, after the bond is closed. Inclusion is conducted by the Market Intel at Climate Bonds.

9. The Role of Green Bonds in Assisting RES & Clean Technology Companies to Grow

Green bonds represent a considerable innovation through their focus on green use of proceeds, tracking, impact reporting and external reviews. They have provided bond investors with an unprecedented degree of transparency as well as a capacity to become involved in corporate strategies in a manner which was previously largely reserved to equity investors. It has also enabled bond markets to become a powerful force in green and climate mitigation finance.

However, concerns have been raised that the role of green bonds in financing new and especially additional green and climate mitigation projects has been limited. The criticism is often that these projects would have in any case been funded by the mainstream bond markets. This arises arguably as the result of a misunderstanding of the structural refinancing role of bonds as described above and from a confusion with project bonds that have fundamentally different characteristics from other bonds.

Firstly, the debt capital markets offer many options for issuers wishing to raise money against their balance sheets and to re-finance projects. This has been especially true in the context of recent and ongoing favourable market conditions. Green bonds, however, ensure that refinancing occurs in a manner that uniquely serves the issuer's sustainability objectives and highlights them to all stakeholders. Projects that are being refinanced through green bonds are presented with full transparency and benchmarked against green definitions and taxonomies with the input of external reviews. This would not occur with other types of mainstream debt finance. Refinancing also of course makes additional funds available that can be reinvested into new green projects or to finance an issuer's overall transition strategy. These projects can be in turn refinanced by new green bonds and so on.

Secondly, project bonds are a niche market that especially finance infrastructure and where investors take a portion of the completion and/or performance risk of the project itself rather than the balance sheet of a corporate. The green bond market is already a much larger market than project bonds and one that successfully combines the refinancing approach of the mainstream bond markets with innovative visibility and benchmarking on green projects. Nonetheless, the concerns raised lead to legitimate questions on the actual role of green bonds and their contribution to sustainability. The benefits of green bonds can be summarised as follows:

- **Converting bond markets to green:** Green bonds have momentum in the international bond markets and are converting increasing number of issuers. This is important because (i) the capital flows being channelled to green projects are now without doubt substantial (\$170-180 billion in 2018), (ii) issuers are committing themselves to unprecedented levels of transparency and reporting on their green projects and (iii) are building an investor base that is committed to green investors and has an inherent interest in follow-on green issues.
- **Enabling corporate and institutional transition:** Green bonds create unprecedented market, and in some case media, visibility on the sustainability projects of both public and private issuers. The overwhelming majority of these issuers are aligned with the Green Bond Principles which have been increasing the emphasis on issuers communicating an overall transition strategy to the market and their investors by recommending that issuers position their green projects within their “overarching objectives, strategy, policy and/or processes relating to environmental sustainability”. Issuers are subject to intense scrutiny from investors as well as from civil society on this point. At the issuer level, many executives have also testified within the context of regular feedback to the Green Bond Principles’ Executive Committee that the process associated with green issuance represents a strong in-house knowledge sharing and awareness building exercise that connects the treasury, business, sustainability, investor relations and reporting functions with the corporate organisation in a way that is seen as an important and unforeseen benefit.
- **Making green and climate investible:** the green bond market has considerably progressed the debate on what is green by facilitating the emergence of both market-based and regulatory definitions of what is green. These include, for example, the high-level project categories of the Green Bond Principles, the Climate Bonds Taxonomy³⁰, and People’s Bank of China Green Bond Catalogue. In parallel, an ecosystem of firms and organisation drawn from the academic, audit, rating and consulting worlds (referred to collectively as “external reviewers”) has developed to provide advisory services on how to interpret and verify green projects. This ecosystem has allowed the markets to invest with much greater confidence in green projects without being held back by the detail of ongoing scientific or academic

³⁰ Climate Bonds Initiative (2022), “Taxonomy”, <https://www.climatebonds.net/standard/taxonomy>

debates on green definitions. The EC's Taxonomy integrate and build on the classifications developed for the international green bond market³¹.

The Taxonomy Regulation³² was published in the Official Journal of the European Union on 22 June 2020 and entered into force on 12 July 2020. It establishes the basis for the EU taxonomy by setting out 4 overarching conditions that an economic activity has to meet in order to qualify as environmentally sustainable.

The Taxonomy Regulation establishes six environmental objectives:

- Climate change mitigation
- Climate change adaptation
- The sustainable use and protection of water and marine resources
- The transition to a circular economy
- Pollution prevention and control
- The protection and restoration of biodiversity and ecosystems

The European Commission presented on 6 July 2021 a proposal for a Regulation of the European Parliament and of the Council on European green bonds.

- **Progressing the policy debate on green finance:** the green bond market has also provided policy makers an example of a largely market driven and successful initiative addressing green challenges and climate change mitigation. This has stimulated debate on how it may be further supported and how it may inform wider policy initiatives. A number of governments have developed public policies to facilitate the issuance of green bonds. This has been the case in China (government guidelines for green bond issuance in various sector, capital and repo rates incentives), France (official label for green funds), ASEAN countries (definition of an ASEAN Green Bond

³¹ EU Commission (2021), "Proposal for a Regulation of the European Parliament and of the Council on European Green Bonds", https://eur-lex.europa.eu/resource.html?uri=cellar:e77212e8-df07-11eb-895a-01aa75ed71a1.0001.02/DOC_1&format=PDF

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN>

³² Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN>

standard), India (listing disclosure requirements for Green Bonds on the Securities Exchange Board of India).

10. IENE's Advisory Role in the Issuance of Green Bonds

Over the years, IENE has built a regional network of energy experts with considerable experience on RES and Energy Efficiency projects, including advisory and assurance professionals, with solid experience and hence capable in supporting clients on green bond issuance across SE Europe. Between them, team members have worked on some of the leading issuances to date. IENE offers a wide range of services to support companies and investors during the lifecycle of green bond issuance. More specifically, IENE can offer the following range of services:

1. **Review financing options:** IENE reviews and challenges the financing objectives and alternatives, enabling the investor to optimize the capital structure and making the most of debt market appetite. IENE specialists can help determine a preferred funding route, and act as a sounding board for the investor's management team.
2. **Design green bond criteria:** IENE can help develop a green bond framework, 'green' criteria and specifications for the management of proceeds. IENE professionals can advise on project selection and evaluation, fund management processes and controls, and benchmark processes against industry best practice and evolving standards.
3. **Execution:** IENE specialists can advise on the presentation of green credentials to potential investors and the issuance process of the debt, and liaise with stakeholders including credit rating agencies. In this context, IENE can:
 - (a). Prepare the necessary "green bond" report (i.e. Verifiers' Report) and information form
 - (b). Obtain a decision on Pre-Issuance Certification
 - (c). Facilitate the issuance of the "green bond" using the Certified Climate Bond mark
4. **Ongoing stakeholder management:** Once issued, IENE can help the investor assess the performance of a green bond through independent bond investor studies, giving unbiased insight into bondholders' perspectives and into the profile of bondholders.

5. **Third-party independent assurance:** To increase the credibility of the green bond, IENE can provide assurance on the issuer's processes and control for selecting green projects and managing proceeds, as well as on the issuer's progress reports.
6. **Monitoring and reporting:** IENE can undertake to develop performance indicators and project evaluation metrics to monitor and report on the financial and environmental outcomes of projects. Furthermore, IENE can support the investor in reporting to his company's internal and external stakeholders. In this context, IENE will assist the investor in:
 - (a). Confirming the certification post-issuance within 12 months
 - (b). Reporting annually on the progress of the funded project(s).

Appendix I – The Institute of Energy for SE Europe

The Institute of Energy for South East Europe (IENE) was founded in 2003 as an independent body by a small group of energy professionals and business executives active in the energy sector of the region. The Institute, which has its headquarters in Athens, Greece, is a non-governmental and non-profit organization (see www.iene.eu for further information).

Goals and Objectives

The Institute's prime purpose is to constitute a permanent forum where energy issues can be discussed, analyzed, reformulated and presented to a broader audience, in unbiased, objective and credible terms. This is achieved thanks to the Institute's scientific standing, its managerial rectitude and the transparency of all its operations.

One of IENE's key objectives is to participate in the formulation of energy policies, both at national and international level, within the broader region of SE Europe. These policies focus on rationalizing the production and utilization of both conventional and renewable sources of energy. IENE is thus contributing towards the implementation of the European Union's sustainable strategy which combines social and economic development with environmental protection. The Institute aspires to play a significant role in providing public opinion with factual and unbiased information on subjects concerning energy, the environment and sustainable development.

Mission and Vision

IENE's **mission** is to promote a broader understanding of the key energy issues in the region and provide a suitable platform for the exchange of views and information, open to professionals, companies, stakeholders and others who are actively involved in the energy sector.

The **vision** of IENE's founders and those of its members is to establish the Institute as the leading energy think tank in the region and at the same time develop a highly credible range of activities covering research, assessment studies, sectorial surveys, advisory services, educational activities, event organisation and networking. Such services to be offered primarily to its members, but also to government and industry and other important stakeholders. As part of its vision, IENE is committed to developing high-level research and

analysis capabilities, with the involvement and in cooperation of leading energy experts from all different countries of the region.

The timely dissemination of information and analysis is an integral aspect of IENE's work with the aim of facilitating the understanding of central policy and complex technical issues; thus, helping to promote an informed public debate. The establishment of serious and dispassionate dialogue on SE Europe's key energy and environmental issues is seen as part of a democratic policy making process to which IENE is fully committed.

Operation

The Institute's headquarters are in Athens while it has a well-established network of associates and expert advisors in all countries of the region and beyond. A small number of permanent administrative and secretarial staff is responsible for manning the Institute's daily operations. This staff is backed by a number of external associates, engaged in diverse activities ranging from research to report preparation (see www.iene.eu under Organisation and Management for a detailed insight into IENE's structure and operation).