Green Bonds: Introduction and regulatory framework

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ABSTRACT

In the past few years, the consequences of climate change have increasingly led to an immediate need for action. Fortunately, the public has largely shaped the necessary awareness when it comes to the urgency of the issue. Therefore, effective measures must be taken in order to face the various challenges of climate change. Significant institutions like the United Nations and the European Union have taken the lead by developing initiatives and action plans that define which measures are to be implemented to overcome these challenges. Some of them include the UN SDGs 2030 Agenda, the Paris Agreement, the EU Action plan and the EU Green Deal. They all build the fundament for the future sustainable development path. One crucial question in this regard is how the various initiatives and projects in the sustainable development context will be financed. Here capital markets play a crucial role. By shifting more capital in green projects, sustainability can be promoted and eventually significantly improved. In the past few years one of the emerged financial instruments with this objective are green bonds. However, despite their popularity investors are faced with the challenge of a lack of transparency. Nevertheless, policymakers have taken this issue seriously which is why new solutions have been introduced. Regulation plays a crucial role when it comes to ensuring transparency in the market.

This paper offers an introduction to green bonds, their significance, and their challenges and lastly it gives an overview of the regulatory framework. Overall, it is important to clarify that despite its challenges the green bond market shows to be an essential tool in the capital markets when it comes to promoting sustainable development which is why discussing proper and effective regulatory solutions is so crucial.

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List of Abbreviations

CBI	Climate Bonds Initiative
ESMA	European Securities and Markets Authority
EU	European Union
EU Action plan	EU Action plan on financing sustainable growth
EU GBR	Regulation on European Green Bonds
EU GBS	European Green Bond Standard
GBP	Green Bond Principles
GSS bonds	Green, social and sustainability bonds
ICMA	International Capital Market Association
SBG	Sustainability Bond Guidelines
SBP	Social Bond Principles
SDGs	Sustainable Development Goals
SFDR	Sustainable Finance Disclosure Regulation
SLBP	Sustainability-Linked Bond Principles
SLBs	Sustainability-linked bonds
Taxonomy Regulation	European Taxonomy Regulation
UN	United Nations

1. Introduction and course of analysis

Nowadays our planet is facing one of the worst challenges of all time: climate change. The consequences thereof can be seen in numerous extreme weather conditions and disasters – from flood, through heat waves, storms, etc. (Gregg et al., 2023, p. 846).

In the light of the urgency of the issue in question as well as its effect on the whole planet, it is not possible anymore to postpone the development of proper measures. Since policy makers and experts are aware of this, many initiatives and regulatory frameworks have already been introduced and enforced in the past few years. Furthermore, they are constantly being reevaluated and adjusted. In the face of the necessary sustainable development and especially its necessary financing, the capital markets play a crucial role. Therefore, more sustainable projects and initiatives should be promoted.

For this reason, many new financial instruments with a sustainable character have emerged. One of them are green bonds (Institut der deutschen Wirtschaftsprüfer, 2021, p. 3).

> *„The emergence of green bonds represents a landmark moment in financial innovation which is fundamental to supporting the energy transition, by redirecting public and private capital towards green projects/assets"* (Maino, 2022, p. 30).

This paper deals with the question of *what role green bonds play in the capital markets, which challenges is the green bonds market facing and what solutions exist for these issues*.

Firstly, this paper introduces green bonds and their challenges. Secondly, it discusses regulation as the main solution for the improvement of the green bonds market. This includes the extensive sustainable finance regulatory framework consisting of, among others, the European Taxonomy Regulation, and the Sustainable Finance Disclosure Regulation. In addition to that, other regulatory standards which are specific for green bonds are presented. The focus lies here on the European Green Bond Standard.

The hypothesis is that green bonds are valuable financial instruments when it comes to promoting sustainable development and that a solid regulatory framework can solve the current challenges in the green bonds market.

2. Green transformation of capital markets

In order to address some of the most severe global issues such as combating poverty, world hunger and dealing with human crises, different regulatory frameworks have been introduced. The central framework stems from the United Nations (UN) which is the *UN Agenda 2030* that has been introduced in 2015. This agenda contains 17 objectives, the so-called *Sustainable Development Goals* (SDGs) which are accepted by all countries (UN, 2015). The following *figure 1* presents the UN SDGs.

Figure 1: *UN Sustainable Development Goals*

UN SDGS:

1	No poverty	**10**	Reduced inequality
2	Zero hunger	**11**	Sustainable cities and communities
3	Good Health and well-being	**12**	Responsible consumption and production
4	Quality education	**13**	Climate action
5	Gender equality	**14**	Life below water
6	Clean water and sanitation	**15**	Life on land
7	Affordable abd clean energy	**16**	Peace, justice, and strong institutions
8	Decent work and economic growth	**17**	Partnership for the goals
9	Industry, innovation, and ifrastructure		

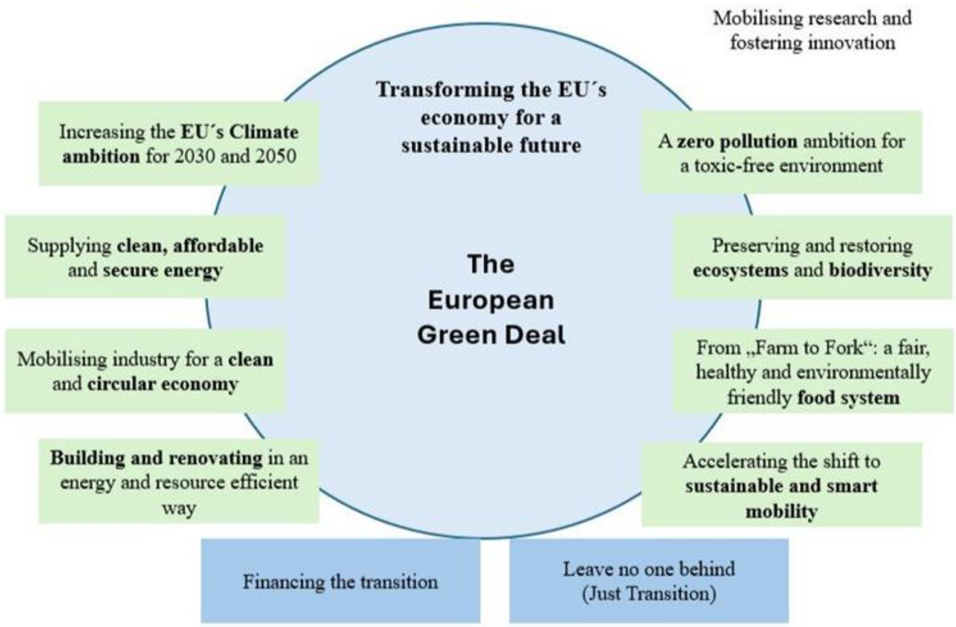
Source: Own representation based on UN, 2023

In the context of the *UN Agenda 2030* in December 2015 195 countries signed the first global climate deal: the *Paris Agreement* (European Union, 2018). This treaty on climate aims to limit the increase of global temperature to 1.5° compared to the pre-industrial level (UNFCCC, 2015, p. 4).

The European Union (EU) has also taken the lead in facing the challenges of climate change. Thus, in 2018 the EU defined the *EU Action plan on financing sustainable growth* (in short: EU Action plan). This strategic plan entails ten action steps. The first one is the establishment of an EU classification system for sustainable activities, which was later implemented in the form of the European Taxonomy Regulation (see chapter 4.1). The second one deals with the creation of a European Green Bond Standard, which will be presented in detail in chapter 4.3. The third action item revolves around shifting capital towards more sustainable projects. To achieve the goals in alignment with the *UN Agenda 2030*, the EU has established a yearly gap of approximately €180 billion. Since the public capital is not sufficient, the key objective is to mobilize private capital towards sustainable projects (European Union, 2018, p. 2). For this reason, institutional investors play a significant role (Maino, 2022, p. 26).

Hence, to make sustainable investments more attractive to private people, transparency is essential. In order to enhance the overall transparency for the market participants a strong regulatory framework needs to be established (European Union, 2018). With this regard the EU has introduced a measurement package, the so-called *European Green Deal*. Its objective is to achieve climate neutrality for Europe by 2050, thus making it the first climate-neutral continent (European Commission, n.d.). The following *figure 2* shows various aspects covered by the *European Green Deal*.

Figure 2: *The European Green Deal*



Source: Based on European Commission, 2019, p. 3

3. Green bonds

3.1 Definition of green bonds

The World Bank defines a green bond as *"(…) a debt security that is issued to raise capital specifically to support climate-related or environmental projects"* (World Bank, 2015, p. 23).

Figure 3: *Sustainability-linked and use-of-proceeds bonds*

1. SLBs	Any type of instrument for which the financial or structural characteristics can vary **depending on** whether the issuer **achieves predefined sustainability objectives**
2. Use-of proceeds bonds	Any type of instrument where the **net proceeds** (or an equivalent amount to the net proceeds) are exclusively used to finance or refinance, in part or in full, new and/or existing eligible **green and/or social projects.**
2.1 Green bonds	Instruments that raise funds for projects with **environmental benefits** including renewable energy, green buildings, and sustainable agriculture.
2.2 Social bonds	Instruments that raise funds for projects that address or mitigate a specific **social issue** and/or seek to achieve position **social outcomes**, such as improving food security and access to education, healthcare, and financing, especially but not exclusively for target populations
2.3 Sustainability bonds	Instruments that raise funds for projects with **both environmental and social benefits.**

Source: Own shortened representation based on S&P Global, 2023, p. 6

Based on this "green" label investors can draw the conclusion that the associated proceeds are invested in projects having a positive impact on the environment (Institut der deutschen Wirtschaftsprüfer, 2021, p. 3). How much truth this necessarily beholds will be discussed in chapter 3.3.

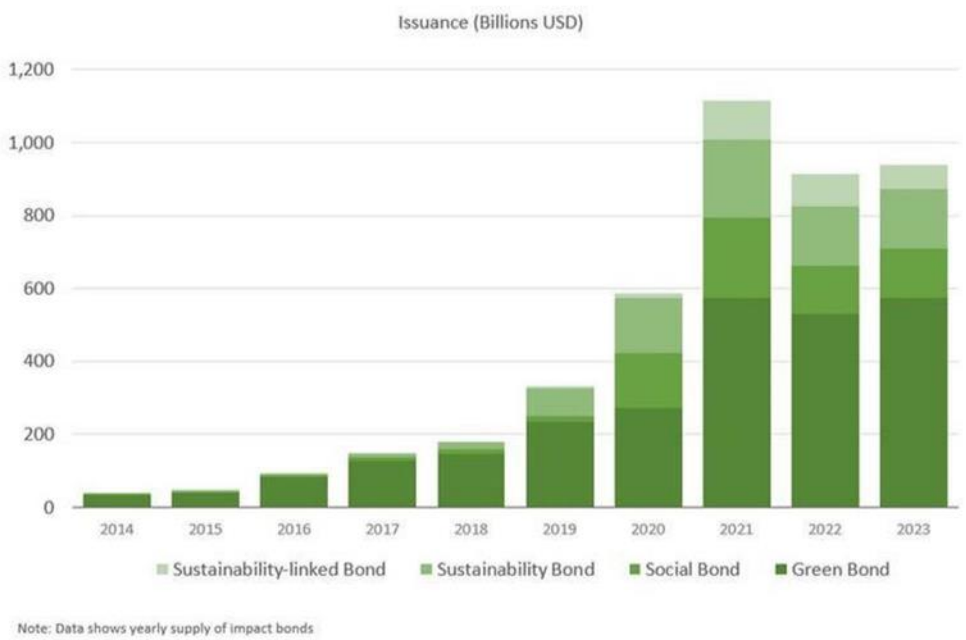
As shown in *figure 3* the International Capital Market Association (ICMA) differentiates between the *use-of-proceeds* and *sustainability-linked bonds (SLBs)*. There are three subcategories of the *use-of-proceeds bonds* which are *green*, *social* and *sustainability bonds* (in short: GSS bonds) (S&P Global, 2023, p. 6).

However, when it comes to their financial structure there are no significant differences between green and conventional bonds. The sole difference lies in the disclosure of information regarding the environmental impact of the proceeds from green bonds (Cochran, 2016, p. 8).

3.2 Significance of the green bonds market

Since the first climate awareness bond issued by the European Investment Bank in 2007, followed by the first green bond issued by the World Bank in 2008, the market for GSS bonds, has been increasing ever since (Institut der deutschen Wirtschaftsprüfer, 2021, p. 4). From then on within only ten years the emission volume of green bonds rose from $1 billion to $143 billion (Flammer, 2019 as cited in Al-Mheiri; Nobanee, 2020, p. 3). In 2023 that volume almost reached $600 billion whereas the total volume of GSS bonds almost reached $1 trillion. *Figure 4* shows the exact development of the issuance of GSS bonds (Bloomberg, 2024).

Figure 4: *Issuing volume of GSS bonds from 2014 and 2023*



Source: Bloomberg, 2024

The increase in issuance of green bonds is probably connected to the benefits they offer. Indeed, green bonds have been shown to provide numerous benefits for various actors. The following *figure 5* shows some of the benefits for issuers, investors, and policymakers (Cochran, 2016, p. 4).

Figure 5: *Benefits of green bonds for different actors*

Actor	**Benefits**
Issuers	▪ Helping issuers communicate the sustainability strategy ▪ Improving relationships with debt providers and broadening the "investor base" ▪ Creating internal synergies between financial and sustainability departments
Investors	▪ Helping investors to develop better-informed investment strategies ▪ Facilitating the smooth implementation of long-term climate strategies ▪ Helping responsible investors broaden their restricted investment portfolios
Policymakers	▪ Indirectly supporting the implementation of the low-carbon transition by better matching green issuers and investors

Source: Based on Cochran, 2016, p. 4

3.3 Challenges

Since the market for green bonds is still developing, it is quite understandable that market participants are confronted with different challenges. One of the great challenges is the lack of transparency. This relates to the potential misunderstanding when it comes to the environmental integrity of green bonds, such as their underlying objectives and strategy. Due to different possible expectations of what green bonds mean and what kind of impact they are supposed to have or not have, there is moreover a risk that the communication of green bonds can be viewed as greenwashing (Cochran, 2016, p. 13).

> In the "Progress Report on Greenwashing" (2023) the European Supervisory Authorities[2] define *"greenwashing as a practice where sustainability-related statements, declarations, actions, or communications do not clearly and fairly reflect the underlying sustainability profile of an entity, a financial product, or financial services. This practice may be misleading to consumers, investors, or other market participants"* (European Securities and Markets Authority, 2023, p. 11).

The risk of greenwashing can affect both investors and issuers. On the one hand, the investors are sometimes unable to evaluate the overall objectives of the green bonds due to various specifications from different standards. On the other hand, certain issuers might not be willing to issue any green bonds since they are not willing to risk being blamed for greenwashing (Munoz; Smolenska, 2023, pp. 27-28). There are different scenarios in which the issuing of green bonds can be regarded as greenwashing. In a report KPMG has defined the following events. For instance, the bond proceeds can be used for funding activities which are not regarded as entirely sustainable by the market participants. Moreover, the financing of projects can perhaps be nontransparent, so that it remains unclear what the bond proceeds will fund or whether environmental objectives have been fulfilled. Furthermore, it can be questionable if the issuer of a green bond operates in markets that are not sustainable or is involved in non-sustainable events (KPMG, 2015, p. 10 as cited in Cochran, 2016, p. 14). For instance, in 2022 the Hong Kong Airport Authority used a previously issued green bond for developing a new runway, an event that posed a serious danger to Chinese white dolphins that were already threatened from extinction. This use of green bond proceeds was highly criticized since it imposed a negative impact on the environment and hence was far from being a sustainable project (Financial Times, 2022). This makes one question the "greenness" of the green bond when it comes to what extent sustainability objectives are in the focus. However, since the regulatory authorities are aware of the significance of these issues, they have started introducing definitions and standards with the aim to ensure transparency in the green bonds market.

[2] These are the European Banking Authority (EBA), the European Securities and Markets Authority (ESMA) as well as the European Insurance and Occupational Pensions Authority (EIOPA) (European Central Bank, 2024).

4. Regulatory framework

4.1 European Taxonomy Regulation

The fundament of the sustainable finance framework builds the European Taxonomy Regulation (in short: Taxonomy Regulation) (European Union, 2020). The aim of the Taxonomy Regulation is to establish a classification system for measuring the sustainability of economic activities (European Union, 2020, p. 4). This is fundamental for sustainable financial products such as herein discussed green bonds.

Article 3 of the Taxonomy Regulation sets the criteria for environmentally sustainable economic activities. Thus, an environmentally sustainable economic activity must contribute to one or more of the environmental objectives defined in Article 9, must not significantly harm any of those objectives and must be in line with the minimum requirements in accordance with Article 18 of the Taxonomy Regulation (European Union, 2020, p. 15). Some of the environmental objectives set in Article 9 of this regulation include pollution prevention, protection and restoration of biodiversity and ecosystems, and transition to a circular economy[3] (European Union, 2020, p. 17).

4.2 Sustainable Finance Disclosure Regulation

Closely linked to the Taxonomy Regulation is the Sustainable Finance Disclosure Regulation (in short: SFDR) from 2019. This regulation was created as response to lacking disclosure requirements when it comes to sustainability-related impact of financial products aiming to achieve any kind of environmental objectives (European Union, 2019, p. 5, section 24). According to Article 1 of SFDR this regulation affects financial market participants[4] as well as financial advisors[5] through transparency rules when it comes to the consideration of sustainability risks, adverse sustainability impacts, and sustainability-related information regarding financial products.

[3] According to Article 2 section 9 of the Taxonomy Regulation: "'circular economy' means an economic system whereby the value of products, materials and other resources in the economy is maintained for as long as possible (…)" (European Union, 2020, p. 14).

[4] The definition is provided in Article 2 section 1 of the SFDR. According to Article 2 section 1 letter b) an example of a financial market participant is an investment firm providing portfolio management (European Union, 2019, p. 7).

[5] The definition is provided in Article 2 section 11 of the SFDR. According to Article 2 section 11 letter d) a financial advisor can be for instance an investment firm providing investment advice (European Union, 2019, p. 7).

One crucial component of the SFDR is the classification of financial products in Article 6, Article 8, and Article 9 products (European Union, 2019, pp. 10-13).

For all three product categories there are some common requirements. Firstly, entities should disclose information on the integration of sustainability risks. Secondly, they should disclose information according to Article 7 of the SFDR regarding the principle adverse impacts (PAI) considerations (KPMG, 2021). These refer to the principle of "do no significant harm". Annex I of the Delegated Regulation (EU) 2022/1288[6] contains a table with PAI indicators. Some examples of such indicators include greenhouse gas emissions, carbon footprint and activities negatively affecting biodiversity-sensitive areas (European Union, 2022, p. 42).

For *Article 6 products*, which are more mainstream financial products, there are no specific additional requirements. In contrast to that, *Article 8 products* are products that promote environmental and/or social characteristics. Hence, entities should disclose information on how these characteristics are met. Lastly, *Article 9 products* are products with the aim of achieving a certain sustainable investment objective. Hence, it is necessary to disclose information on how this objective shall be achieved and which impact it has (KPMG, 2021; European Union, 2019, pp. 10-13). While *Article 8 products* are called "light green" financial products, *Article 9* products are referred to as "dark green" financial products (Brühl, 2022, p. 257).

4.3 Green Bond Principles and European Green Bond Standard

In 2018 the High-level expert group on sustainable finance (HLEG)[7] published its recommendations in the context of sustainable finance. One of them deals with the development of a European Green Bond Standard (in short: EU GBS). In general, the reason for introducing regulation in this market is to increase the investments in green projects which contribute to UN SDGs by attracting more investors and encouraging new issuer types (HLEG, 2018, p. 31).

Before the European Green Bond Standard was finalized (as it will be discussed later in this chapter) there have been other standards that were previously established in the market; the majority of which being only on the voluntary basis (PwC, 2023, p. 15). The most important ones are the Climate Bonds Standard by the Climate Bonds Initiative (CBI) as well as the Green

[6] Regulatory technical standards (RTS) of the SFDR (European Union, 2022).

[7] This is an expert group established by the European Commission in 2016 (European Commission, 2016).

Bond Principles by the ICMA (Maino, 2022, p. 17). The extensive regulatory framework by the ICMA consists of the Green Bond Principles (GBP), the Social Bond Principles (SBP), the Sustainability Bond Guidelines (SBG) and the Sustainability-Linked Bond Principles (SLBP) (ICMA, 2021, p. 2). The GBPs offer guidelines on four different dimensions: the use of proceeds, the process for project evaluation and selection, management of proceeds and reporting (ICMA, 2021, p. 3).

These private regulation initiatives emerged due to the absence of public regulation (Banahan, 2019, p. 848 as cited in Pyka, 2023, p. 626). Before the Regulation on European Green Bonds (in short: EU GBR)[8] was published in November 2023 (European Union, 2023), its fundament was already laid down in the *EU Action plan*, as mentioned in chapter 2 (second action item within the EU Action plan) (European Union, 2018 as cited in Pyka, 2023, p. 625).

After considering the received feedback from 100 organizations the EU Technical Expert Group on Sustainable Finance (TEG)[9] published its final report on an EU Green Bond Standard in June 2019 (TEG, 2019, p. 8). In this report the TEG emphasizes introducing a voluntary standard that would enhance transparency, without disrupting the market. Furthermore, the EU GBS should ensure that the green projects financed through the bond proceeds are strictly in line with the Taxonomy Regulation (TEG, 2019, pp. 9-10). The difference between the previously described private regulation measures by the CBI and the ICMA in contrast to the European Green Bond Standard is that the administrative supervision when it comes to the EU GBS is more "far-reaching" (Pyka, 2023, p. 630), especially when it comes to the regulation of external reviewers via a supervisory authority (Munoz; Smolenska, 2023, p. 28).

The decision to issue a European Green Bond instead of a green bond in accordance with the aforementioned private standards consequently means that the issuer has to adhere to the requirements set in the EU GBS (BaFin, 2024). To do so, in accordance with Article 14 EU

[8] "Regulation (EU) 2023/2631 of the European Parliament and of the Council of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds"

[9] The TEG was established by the European Commission in 2018 with the aim of assisting in different areas of the EU Action plan (TEG, 2019, p. 8).

GBR the issuer must draw up a prospectus according to the Regulation on the prospectus[10] before the issuance of the bond (European Union, 2023, p. 18; BaFin, 2024).

According to Article 1 of the EU GBR, the objectives of this standard are explicitly to lay down requirements for issuing European Green Bonds, to establish a system for registration and supervision of external reviewers, and to provide disclosure templates for the European Green Bonds (European Union, 2023, p. 12). Article 4 of the EU GBR states that all proceeds of a European Green Bond must be allocated completely in accordance with the Taxonomy Regulation (European Union, 2023, p. 13). Hence, the proceeds must fulfill the criteria set in Article 3 of the Taxonomy Regulation, as explained in chapter 4.1 of this paper (see also European Union, 2023, p. 12, Article 2). Articles 10 and 11 of the EU GBR specify further requirements considering the pre- and post-issuance stages of European Green Bonds. In accordance with Article 10 EU GBR prior to the issuance of a European Green Bond, the issuer shall provide a factsheet in accordance with Annex I EU GBR and make sure that a pre-issuance review by an external competent authority has taken place. Additionally, according to Article 11 EU GBR the issuer shall publish an allocation report using the templates provided in Annex II EU GBR and ensure that post-issuance reviews by external reviewers have taken place (European Union, 2023, pp. 16-17). Title IV of this regulation deals with requirements for external reviewers. For instance, all external reviewers must be registered with the ESMA in line with Article 22 EU GBR (European Union, 2023, p. 23).

Overall, the EU GBR enhances transparency for the investors by requiring the issuers of European Green Bonds to comply with the strict and extensive specifications laid down in this regulation.

5. Conclusion

This paper shows how the European Union has taken the lead in addressing climate issues and what role do the capital markets and herein discussed green bonds play in combating these challenges. Furthermore, this paper demonstrates the significance of green bonds for different market participants and the overall achievement of the sustainability objectives while also taking into account the challenges that the market participants are facing.

[10] "Regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/ECText with EEA relevance".

With regard to the question from the beginning of this paper it can be established that the regulation in form of the European Green Bonds Standard plays a crucial role in the market by holding issuers accountable and by establishing transparency for the investors. The European Green Bonds Standard was the missing piece in the constantly increasing EU sustainable finance regulatory framework, contributing to the overall UN SDGs. With this standard the transparency in the market is increased, and as a result the issuance volume of green bonds can be expected to keep growing, hence contributing to the overall green transition.

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Budapest, 1st of April 2024