

Department  
of Economics and Finance – Major in Finance

Course of Financial Markets and Institutions

Development and Trends  
in Green Bond Market:  
the *JSC Russian Railways* Case

---

Valentina Peruzzi

SUPERVISOR

Federico Poggioli

221671

---

CANDIDATE

Academic Year 2019/2020



# Table of contents

<b>Introduction.....</b>	<b>4</b>
<b>Chapter 1. What is a green bond? .....</b>	<b>6</b>
1.1 Green Bond definition and typologies.....	6
1.2 The pricing of green bonds.....	8
1.3 The issuing process .....	9
1.4 Listing: LSE, Euronext, LuxSE.....	11
1.5 Advantages and disadvantages of green bond.....	14
<b>Chapter 2. The Green Bond Markets.....</b>	<b>16</b>
2.1 Evolution of the Green Bond Market .....	16
2.2 Market development and functioning in the EU .....	18
2.3 Market development and functioning outside the EU.....	21
2.4 Markets in developing countries .....	25
<b>Chapter 3 JSC Russian Railways .....</b>	<b>29</b>
3.1 Russian green bond market .....	29
3.2 JSC Russian Railways action for environment protection .....	31
3.3 Green bond framework.....	33
<b>Conclusion.....</b>	<b>37</b>
<b>References .....</b>	<b>40</b>

# Introduction

Nowadays, more and more institutions and firms, both at global and local level, are experiencing an increase in their commitment towards environment and low-carbon-emission investments. Among the other industries, also the financial one is highly engaged in this field. In fact, when calculated against several benchmarks, sustainable finance grew at a substantial pace. Financial institutions are aligning themselves more and more with sustainable growth; sustainable finance covers also a preeminent position within the G20. In a increasing number of financial institutions, including pension funds, banks and insurance providers, sustainability-related factors and more recently, the Sustainable Development Goals (SDGs), are gradually being taken into account in investment decision-making and the development of new products: green bonds and other investment products and instruments related to sustainability is increasing at a fast pace. Indeed, the SDGs are becoming increasingly a structure around which the players are organising themselves around the entire investment chain.

UN Environment<sup>1</sup> has been tracking the progress of sustainable finance policies as well as wider business trends over the past year, at the behest of the Argentine Presidency. The number, role and characteristics of financial policy and regulatory measures can be evaluated using an internal repository of measures compiled by the UN Environment. The 2017 Green Finance Progress Study provided a foundational structure to better explain sustainable financial growth, evidencing three trends which reinforce each other: (i) increasingly systemic national action, (ii) greater international cooperation, (iii) and increased market leadership at the individual and collective level (Henderson *et al.*, 2019). The 2017 report indicated that the confluence of these trends contributed to a measurable rise in green finance flows and those trends provide a valuable window for understanding the complex dynamics related to sustainable finance scaling. Although the presence of these trends, 2018 was a year in which, actions within countries prevailed together with national developments, but the former with a larger magnitude.

So, the analysis of further advancements and evolutions of such policies and trends is the crankshaft of the inquiry below. In fact, this paper will revolve around a detailed analysis of the state-of-the-art green bonds panorama with a specific focus on the development of their markets all around the world. A particular view has been devoted to developing-economies countries that are

---

<sup>1</sup> The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment ( <https://www.unenvironment.org/about-un-environment> )

experiencing a noteworthy growth in investments related to low-carbon-emissions and eco-friendly initiatives and then in the green bonds market as well.

After the fundamental features of green bonds like definition and typologies are presented, the first chapter focuses on how those particular fixed-income securities are priced as well as issued. Moreover, it has been decided to look at several European stock exchanges (London Stock Exchange, Luxembourg Stock Exchange, Euronext) that mostly have higher volumes of green bonds listed in and traded, also due to the fact that such exchanges have segments dedicated to such kind of securities. The remaining paragraph outlines the pros and cons of manage green bonds both from standpoints of issuers and investors.

Having defined the characteristics and the peculiarities of the green bonds, the second chapter gives a deeper and detailed analysis, full of most-recent and up-to-date statistics and data provided by the main institutions of the field such as the Climate Bond Initiative (CBI) and the Organization for Economic Co-operation and Development (OECD). This is done in order to understand, in a first phase, how the global market evolved since the first green bond issuance in 2013. Then, structures and markets developments inside and outside the European Union are presented in order to make clear the fact that there are substantial differences through different regions and countries with respect to the volume of issuance, currency denomination, and pre- and post- issuance regulation, for instance. Further, the development and the actual state of the green bond market in emerging economies is analysed in order to provide an additional understanding of how those nations are implementing such kinds of debt securities to finance and re-finance green projects.

Following the previous presentation of the markets in developing countries, a particular situation of green bond from such an economy is shown. In fact, the third chapter is entirely devoted to giving firstly an overview on the green bond market in Russia and, secondly, the case of the green bonds, both in May 2019 and May 2020, issued by JSC Russian Railways, Russian national state-owned train company. The peculiarity of such issuances is that the company has been the first entity that has issued green bonds that were not denominated in Russian ruble but in euro, the May-2019 one, and in Swiss franc, the May-2020 one. In addition, the second issuance has been the first denominated in Swiss franc from a Russian firm. So, the framework that emerges from the conclusive chapter is a one in which a company that has a green consciousness, despite is located in a country relatively behind with respect to other countries for what concern polices related to green policies and initiatives but that is rapidly filling the gap.

# Chapter 1. What is a green bond?

## 1.1 Green Bond definition and typologies

Green bonds are defined by the Green Bond Principles (GBP), provided by the International Capital Markets Association (ICMA), as “any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects and which are aligned to the four components of the GBP”. As such, green bonds are designated for eco-friendly projects but backed by the issuer’s entire balance sheet. Also, such bonds face the same risk/return profile as the conventional bonds because investors are exposed to the same credit risk. The definition by the GBP provides an explanation of what a green bond is; by any means, refinements must be made. This is due to the absence of standardisation about the eligibility criteria of projects that can be financed by a green bond, that is their range from pureplay wind farms to retrofitting coal power plants for energy efficiency. Contrarily, this is due to a lack of independent verification (World Bank *et al.*, 2017)

The Green Bond Principles (GBP) were redacted in 2014 through the collaboration of several investment banks: Bank of America Merrill Lynch, Citi, Crédit Agricole Corporate and Investment Bank, JPMorgan Chase, BNP Paribas, Daiwa, Deutsche Bank, Goldman Sachs, HSBC, Mizuho Securities, Morgan Stanley, Rabobank, and SEB. Today ICMA is entitled to monitor and develop guidelines.

The GBP comprise a set of voluntary guidelines with the aim of promoting disclosure, reporting and transparency in the development of the green bond market by making the path for issuance of a green bond clear. Although these guidelines emphasise the required transparency, accuracy and integrity of the information that will be disclosed and reported by the issuers to the stakeholders, the categories according to which a project is targeted as green are not well defined.

The GBP have four main components: (i) the use of proceeds for green projects that should give explicit environmental benefits; (ii) the process for project evaluation and selection, that comprises the communication of the environmental sustainability objectives, the determination by the issuer if the projects fit within the eligible Green Projects categories and the related eligibility criteria; (iii) management of proceeds, that the issuer should track in a pertinent manner; (iv) reporting to increase transparency, communicating the expected impact of projects, and to keep updated information on the use of revenues.

Green bonds need to be aligned to the GBP and the ones not aligned are not said to be green.

ICMA distinguishes four types of green bonds, all aligned with the GBP:

1. *Standard Green Use of Proceeds Bond*, a conventional recourse-to-the-issuer debt obligation, in accordance with the GBP principles, for which revenues should be either accredited to an additional account or transferred to a further portfolio. Moreover, the issuer tracks the proceeds needed to be attested by a well-defined internal procedure. This procedure is going to be related to all those necessary actions to carry on the eligible green projects. Because the bond is a recourse-to-the-issuer one, it allows the investor to sue the issuer in case the latter does not pay back the principal at maturity. Usually those kinds of securities are issued either by supranational institutions (supranational bonds), like the European Investment Bank (EIB) “climate awareness bond” or by firms and banks (corporate bond), as the “Barclays Green Bond”.
2. *Green Use of Proceeds Revenue Bonds* are a non-recourse-to-the issuer debt obligations, meaning that buyers of such securities are not allowed to ask to be refunded in case the issuer fails to repay the principal. However, the debt is backed by cash flows through fees and taxes. Furthermore, the proceeds generated are not certain to go to related green projects, they may go also to unrelated green projects. Usually, issuers of such bonds are governments (sovereign bond) and municipalities (municipal bond). An example is the bond issued by the Hawaiian state, backed by fees on electricity bills of the state utilities.
3. *Green Use of Proceeds Project Bonds* are project bonds issued to finance single or multiple green projects. Strictly related to the underlying projects, investors are directly exposed to the risk with or without possible recourse to the issuer. An example of a project bond is the “Invenergy wind farm” bond, backed by Invenergy Campo Palomas wind farm.
4. *Green Use of Proceeds Securitized Bonds* are bonds collateralized by one or more green projects, including but not limited to covered bonds, ABS, MBS and other structures. The cash flows of the assets are the first source of repayment. This is the case of bonds issued both by Tesla Energy, backed by residential solar leases, and Obivion, backed by green mortgages<sup>2</sup>.

Although ICMA defines the four categories of green bonds discussed above, it is noteworthy to say that there are several bodies concerned in environmental and sustainable activities that issue bonds related to green projects, but they do not respect the four basic principles of GBP. In those cases, the organizations have to make the investors aware of the fact that such bonds are not aligned with the GBP and those companies are invited to embrace, if and when possible, the best practice of GBP, adjusting future with respect to the Green Bond Principles.

---

<sup>2</sup> All examples are taken from <https://www.climatebonds.net/market/explaining-green-bonds> .

## 1.2 The pricing of green bonds

Regarding their pricing, green bonds follow the same procedure as plain vanilla bonds. There are not evidence according to which a bond denominated as green should be priced differently with respect to a standard one, assumed that both are issued by the same body, though issuers of green bonds incur in some negligible costs as certification and third-party review. Indeed, green and conventional bonds are subject to the same market dynamics, such as interest rate expectations, geopolitical issues, and liquidity premia; around those arguments, the idea of flat price has developed and green bonds are said to be *pari passu* with standard bonds. A standard feature of whatever kind of bond is that it may be issued at a higher price with respect to the outstanding debt, leading to a lower yield. Therefore that bond will have a price inside its own yield curve. For a standard bond, it is known as a new issue concession; when this happens for a green bond, it is called *greenium*. In other words, the *greenium* is the risk premium associated with the green bond.

It is noteworthy to say that a large share of investors are willing to pay a premium, accepting a lower spread, to buy bonds labelled as green, leading to an increase the price of the bond at issuance. According to a study (Ehlers and Packer, 2017), green bond issuers on average have borrowed at a lower spread than they have through a conventional bond. This result is consistent with a high demand for green bonds relative to supply, meaning that investors hold large stocks of green bonds to affect their issue price. If the sample of bonds used in the study is decomposed, it appears that the *greenium* is greater for risky borrowers, holders of BBB rated bonds (according to Standard & Poor's rating) (Figure 1).

**Figure 1** Average yield at issuance premia by rating

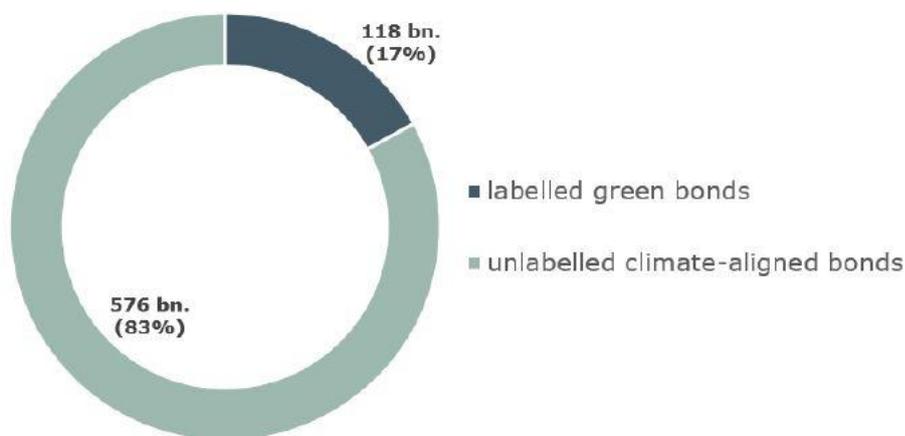


Sources: Board of Governors of the Federal Reserve System; Deutsche Bundesbank; Bloomberg; Ehlers and Packer's 2017 study.

### 1.3 The issuing process

At issuance, green bonds shall comply with the same regulation as the standard “non-green” bonds, in fact, they follow the standard rules of the markets. When a green bond is issued by a firm that is environment-friendly, the bond is usually green but officially it is not denominated as such: in this case, it is defined as an unlabelled green bond. Whereas, when the issuer declares that such bond complies with the four GBP principles (ICMA), although they are voluntary process guidelines, the bond is called a labelled green bond. The first labelled one was issued by the European Investment Bank in 2007 (the “climate awareness bond”).

**Figure 2** Outstanding climate-aligned bonds in bn. USD (as of 31 May 2016)



Source: CBI<sup>3</sup>

However, issuers have to write down a document that delineates the kind of project to be financed, the use and management of proceeds, the commitment to reporting: this paper is called green bond framework (Sustainalytics<sup>3</sup>). The green bond framework needs to be verified by experts in a process called external verification or second-party review, assessing the environmental integrity of the process. The output of this process is not publicly available unless the issuer allows the disclosure. External reviewers and second-party analysts perform a key role in providing investors with additional information and transparency about, for instance, the degree of environmental benefits. In accordance with the ICMA “Guidelines for Green, Social and Sustainable Bonds External Reviews”, all that firms that furnish services of external reviews shall comply with five fundamental ethical and professional principles: integrity, objectivity, professional competence and due care, confidentiality, professional behaviour. Nevertheless, some external reviewers may already be subject to existing professional standards and/or be subject to regulatory regimes. Moreover, it is expected that they join assurance service professional standards and industry-wide code of conducts. ICMA recognizes four

<sup>3</sup> Sustainalytics is a global firm in ESG and Corporate Governance research and ratings

different types with which ascertain and establish the correspondence between the Principles (i.e. GBPs) and such green bond:

1. *Second Party Opinion*: it may be provided by an independent institution with respect to the issuer’s advice otherwise opportune procedures need to be achieved in order to establish the independence of the Second Party Opinion; through the Second Party Review, the institution evaluates and ensure the alignment with the GBP.
2. *Verification*: an issuer may ask to verify a defined set of criteria commonly regarding processes related to business or related to environmental criteria.
3. *Certification*: the Green Bond Framework can be certified using well-defined and generally accepted standards and label as a benchmark. The analysis is carried on by qualified third parties that verify the alignment or not with the certification criteria used as the benchmark.
4. *Green Bond Scoring/Rating*: certified third parties may analyse the Green Bond Frameworks, after the choice of the related green bond issuer, assigning a score/rating following a precise methodology. It important to say that this kind of rating is different from the credit rating.

Among the wide range of external reviewers, the most relevant are CICERO, Moody’s Green Bond Assessments and Standard & Poor’s Green Evaluations. CICERO, a centre for international climate research based in Oslo, that is the main provider of second-party review, grounds his analysis on three different shades of green, dark, medium or light (OECD, 2017), according to the ability of the bond to adhere to a long-run perspective for a low-emission society.

**Table 1** Characteristics of different green bond identification and certification schemes

	CBI Climate Bonds Certification	Green bond indices <sup>1</sup>	CICERO Second Opinions	Moody’s Green Bond Assessments	Standard & Poor’s Green Evaluations
Use of funds must be tied to green investment	Yes	Yes	Yes	Yes	Yes
Eligibility criteria differ by sector	Yes	Yes			Yes
Ex post monitoring/assessment				Yes	
Granular assessments of greenness			Yes	Yes	Yes
Quantitative weights for specific factors				Yes	Yes

<sup>1</sup> Bank of America Merrill Lynch, Barclays MSCI, Standard & Poor’s and Solactive.

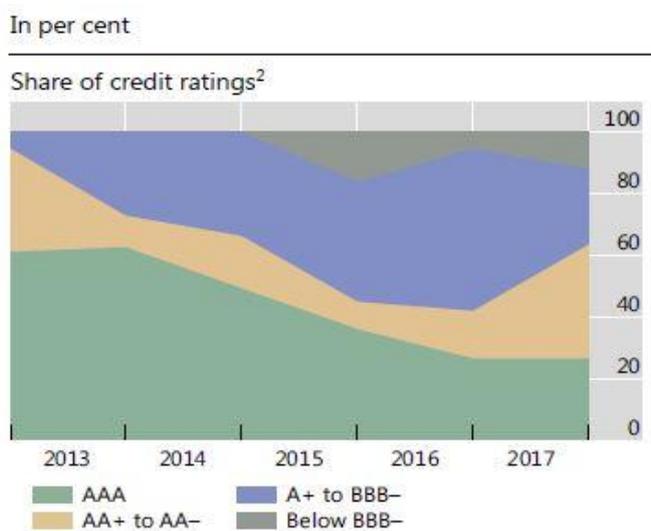
Source: Ehlers and Packer’s 2017 study.

Nonetheless, CICERO analyses the green bond framework when the correspondent bond is issued, thus changes in the document after the issuance are not assessed, unless the issuer does not request it. However, the Green Bond Principles recommend more regular monitoring even if second parties are

not involved in the process. Moody’s Green Bond Assessments (GBAs) are about to estimate the likelihood that the proceeds from the bond will fund to environmentally friendly projects. The latter, Standard & Poor’s Green Evaluations, has a wider focus than the GBAs. According to these green evaluations, a score in between 0 and 100 serves to analyse the overall expected lifetime environmental impact, ceteris paribus (Ehlers and Packer, 2017).

The issuer can ask to evaluate his own green bond in order to fill it in a rating category according to its risk, profitability and the impact on the environment. Usually, green bonds are issued by highly rated institutions and only a small portion, 22% (European Commission, 2016), is rated below the investment grade (BBB).

**Figure 3** Distribution of green bond rating

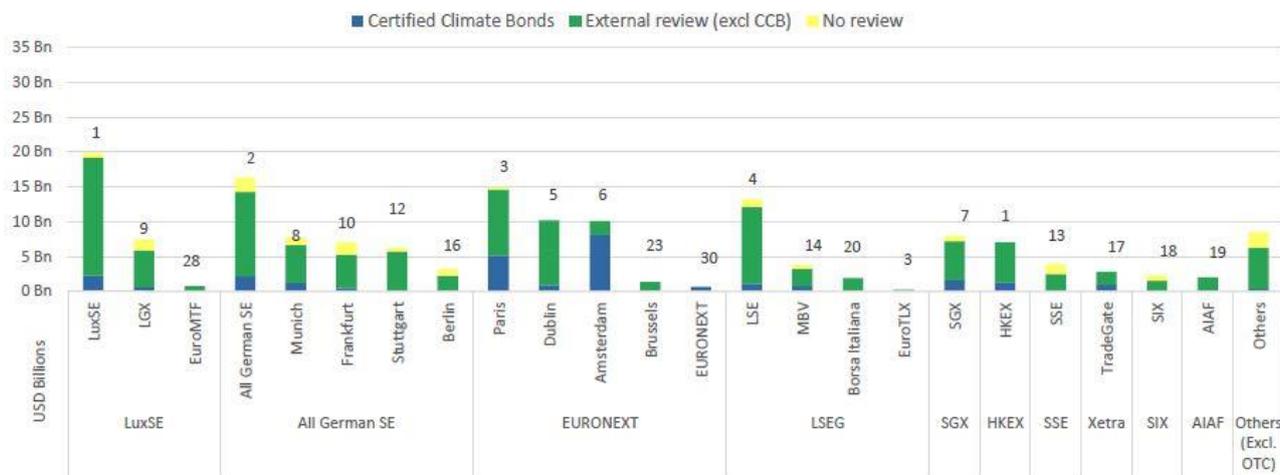


Source: Ehlers and Packer from Bloomberg and CBI data

### 1.4 Listing: LSE, Euronext, LuxSE

As said before, green bonds follow the same rules as a “default” bond and can be issued using base prospectuses. Anyway, stock exchanges have procedures that issuers are requested to follow if they want to list their green bonds. Among all the stock exchanges in the world, examples are the London Stock Exchange (LSE), the EURONEXT GREEN Bonds community from Euronext stock exchange, and the Luxembourg Stock Exchange (LuxSE). In 2019, the latter has established itself as the site that reports the highest number of green bond listing.

**Figure 4 Listing Venues in 2019**



Source: CBI

The issuers that would list their green bonds on the dedicated segment of the London Stock Exchange (LSE) are called for providing the exchange with the green bond framework certified by the entitled second-opinion authority ensuring that the bond is “green”. However, the certifier should satisfy a guidance on several criteria drafted by the LSE in order to include the certified instrument in the relevant LSE green bond segment. Besides, issuers have to provide written proof that the appointed certifier satisfies the following criteria:

- be a legal entity with a registered office in the European Economic Area or Switzerland and that such entity has the required financial resources to conduct the verification;
- be independent of the entity issuing the bond, its directors, senior management and advisers. In particular, the organisation providing the second opinion must not be a subsidiary or owner, either in full or in part, of the entity issuing the bond;
- be remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure;
- have the required financial resources to conduct the verification;
- be an entity specialising in assessing the framework of the bonds’ environmental objectives, with sufficient financial and market-specific expertise to perform a comprehensive assessment of the use of proceeds. Such expertise could be demonstrated, for example, by affiliation with relevant and widely recognized industry bodies or by significant and appropriate previous experience in providing second opinions on green bonds. (LSEG, 2016)

On the EURONEXT GREEN Bonds, issuers of green bonds listed on all Euronext locations (Dublin, Amsterdam, Brussels, Lisbon and Paris) build up a community where all the green bonds are concentrated in order to gain greater visibility. To join the community, green bonds are required

to follow a well-defined procedure. Prerequisites are that such bonds are listed on any Euronext Market, an independent third-party external review, consistent with the ICMA Guidelines for External Reviewers, should be submitted, and that a green bond framework is compiled by an approved verifier under the Climate Bond Standards. Then, during the submission process, issuers listed on any Euronext Market shall fill and submit the “Green Bond Declaration Form” together with other documentation about the green status of such bond. It is noteworthy to say that issuers that would like to join with other the EURONEXT GREEN Bonds do not have to fill again the declaration form: the first one signed will remain valid. Once the issuer has joined the community, he is asked to provide Euronext with updated frameworks and external reviews.

The EURONEXT GREEN bonds create and contribute to the establishment of a community of preeminent issuers related to sustainable investments. However, also investors benefit from the community: they have access to green documentation directly from issuers through a transparent process (Euronext, 2019).

The Luxembourg Green Exchange (LGX) exists since 2016, when the Luxembourg Stock Exchange (LuxSE) decided to set up this exchange entirely dedicated to sustainable securities.

To enter the LGX, initially, investors have to list their bond on one of the two LuxSE’s markets, that is the EU-regulated Luxembourg market (BdI) and the exchange-regulated Euro MTF market. Besides, an LGX application file needs to be filled by the issuers together with the listing application. In the application file, the issuers have to fill in the Green Bond Framework, the external review report, an investor presentation if available and the complete LGX application form, that needs to ensure that the future proceeds are going to be used following the chosen taxonomy (the CBI’s eligibility taxonomy) and the defined framework (the ICMA’s GBP). It is also recommended that the issuers attach a document the share of the proceeds entitled to refinance existing projects or assets and the share that will be devoted to financing new projects.

Then, the LGX expects issuers to furnish external review from a third-party authority. Usually before the issuance but also post-bond issuance, the reviewer verifies if the future allocation and management of proceeds and the project evaluation are in line with the chosen taxonomy and with worldwide accepted principles (i.e. ICMA GBP). Whereas, often within the first year since the issuance day, the reviewer is required to check if the proceeds were used as written in the planned use of proceeds. Although review may take various forms, issuers usually choose to have a second party opinion before the issuance.

Holders of bonds on LGX have the duty to inform about the previous and current use of revenues, through dedicated use of proceeds or ESG reports, in order to make investors aware of how their resources are being allocated to investments and the expected impacts from an environment point of

view. The first report should be filled from twelve months on after the issuance, except for particular case agreed with LGX. Even though LGX promotes ongoing reporting about the use and management of proceeds and the impact up the maturity of the bond, reporting is required until all proceeds are earmarked. On an annual basis, the LGX team revises the bonds' documentation to be certain that issuers comply with disclosure, transparency and reporting requirements. In case of a bond does not meet the eligibility criteria, the LGX can withdraw that bond.

In joining the LGX, both issuers and investors get benefits. Issuers obtain a greener profile and an improved environment-friendly profile due to the greater visibility of their disclosing effort and free upload of sustainability-related documentation. On the other hand, investors benefit from easier access to labelled sustainable securities together with an enhanced comparability among these instruments, free and unrestricted access to information about the sustainability of a project leading to a higher level of transparency (LuxSE).

## **1.5 Advantages and disadvantages of green bond**

Issuance of green bonds presents several advantages and disadvantages in their use for both investors and issuers. From a general perspective, green bonds display considerable benefits providing one more source for green financing, with potential cost advantages, also to enhance the shift from "brown" to greener industries and sectors. Furthermore, both issuers and investors gain in terms of reputations also because a well-defined strategy concentrated on the sustainability.

Looking first at the issuers' side, the most straightforward benefit they obtain is a reputational one: issuing such bonds displays the commitment of the issuer towards the development and the sustainability of the environment, through the implementation of the ESG<sup>4</sup> factors, leading to a likely increase in support for green investments and contributing to an improved dialogue with investors. Furthermore, a more extensive investor base causes an improve in diversification, so demand fluctuations and risk exposure decrease. Finally, governance structures, communication and knowledge sharing between project side and treasury side of the business are improved by a greater monitoring of how revenues are used. Conversely, the greater challenge that issuers face is because of the transaction costs related to the issue, both upfront and at an ongoing basis: labelling, administration, certification, reporting, verification and monitoring requirements. Issuers may also incur in a kind of reputational risk if a bond's green credentials are changed (OECD, 2017).

Shifting the attention to the investors' side, the more evident benefit they get is the possibility to invest in securities, whose proceeds are used in sustainable businesses, without incurring in any

---

<sup>4</sup> Environmental, Social and Governance

additional cost or risk. The latter can be easily assessed taking advantage of the strict transparency requirements about the report of the use of proceeds with respect to an otherwise fixed income market. This increase in transparency in the use of revenues brings to investors otherwise unavailable information on spending efficiency, project details and updates, impact performance: such investor will gain a noteworthy advantage from an information point of view. Internal governance is also improved due to the track of proceeds giving an increase in the global credit quality of the issuer. On the other hand, investors have to bear challenges related to the small size of the market, leading to a possible lack of liquidity, and the consequent small of the issuance. Moreover, due to the absence of a well-defined standard, confusion and a possible reputational risk may arise if questions about the green integrity are raised. This situation may also lead to extra due diligence that not always can be accomplished (OECD, 2017).

So, the green bond market presents several impediments due to relatively-late development of such market but, as long as experience and evidence advance, they can be easily tackled. However, benefits that both issuers and investors receive far outperform the disadvantages incurred in the market.

## Chapter 2. The Green Bond Markets

### 2.1 Evolution of the Green Bond Market

In approximately ten years, the green bond market developed from a nascent and small market into a consolidated and competitive one, with a year-on-year growth.

Instruments devoted to raise awareness on environment and sustainability themes appear for the first time in 2007 with the “Climate Awareness Bond” (CAB) by the EIB. Issued as a zero-coupon bond, it was worth EUR 600 million and the proceeds were allocated towards renewable energy (83%) and energy-efficiency (17%) projects (UniCredit, 2017). The issuance was successfully mainly because the CAB was the first fixed-income instrument that allows investors to allocate resources in climate-related products.

**Figure 5** CAB proceeds allocation by country and by sector



Source: EIB, UniCredit Research

In 2008, the success was confirmed by the emission of the first bond labelled as green by the World Bank and SEB, aiming to increase the overall understanding of the risks associated with climate changes.

The market for bond labelled as green started to skyrocket in 2013, after five years of a relatively little amount of issuance, when in February the IFC issued a USD 1 billion green bond. Then, companies started to join this market increasing considerably the size: the firsts were Vasakronan, a Swedish real estate company, and Bank of America with its “financial sector” (USD 500 million) bond followed by several energy-provider companies, such as Électricité de France (EDF), and firms in the automotive industry like Toyota, that issued a green use of proceeds securitized bond (ABS) whom revenues were used for investments in electric vehicles and hybrids

(OECD, 2017). In the meanwhile, also municipalities started to issue such bonds: the first one was the Île-de-France (the Paris region) in 2012 and then in 2013 both the Massachusetts, with the first Muni Bond, in June and the Swedish city Gothenburg, with the first Green City bond to finance, in October. In 2014 the market continued to increase its size going from an overall issuance of approximately USD 12 billion in 2013 to a volume of about USD 37 billion (International Bank for Reconstruction and Development, 2015). The increasing rate was kept both in 2015 and in 2016 the market sized roughly USD 80 billion (CBI). In 2017, the market hits the threshold of USD 100 billion establishing a new record.

**Figure 6** Growth of green bond market 2014 - 2019



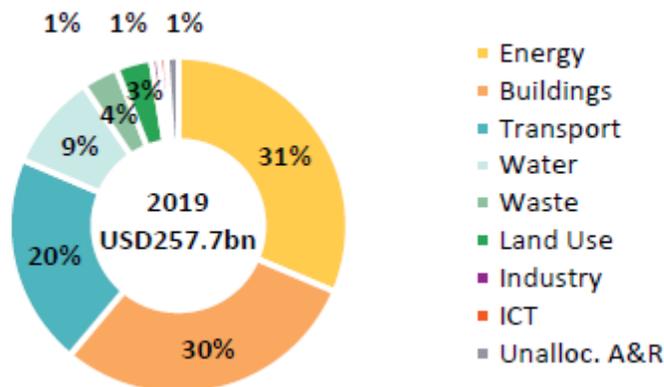
Source: CBI

Nowadays, the market keeps growing each year: 2019 reflected a 51% of growth with respect to the 2018, confirming the ongoing upward trend, and an overall amount of total green bond and green loans issuance equals to USD 257.7 billion. This huge volume was largely powered by the European market, with a 45% share of the global operations, that increased by 74% (USD 49.5 billion) as regards to 2018; it is easy to see that just in the first half of 2019, at the end of June, issuances of EUR-denominated green bonds were 24% greater with respect to the same time frame in 2018. North America registered an expansion of 46%, getting closer to the overall volume of issuances relative to the Asia-Pacific continent, that in 2019 developed by 29%.

Moreover, last year saw a strong increase in green bonds issued by non-financial companies: from USD 29.5 billion in 2018 to USD 59.3 billion in 2019. Non-financial companies contribute for the 23% of the comprehensive volume, establishing themselves as the holders of the largest market share in such year. The main contributions came from three firms that act as energy-provider: Engie, MidAmerican Energy and Energias de Portugal SA (EDP) with a global issuance close to USD 9 billion. Also financial companies sustained steady growth over time hitting nearly USD 55 billion from USD 49.7 billion of 2018, which represents a slightly less share (21%) with respect to the non-

financial one. Top issuers were Chinese (ICBC and Industrial Bank) and French (Crédit Agricole) banks. Then, government-backed entities' issuances that account for around 15% of all green bonds with top 5 bodies that delivered a combined volume of USD 14.2 billion. Green ABS and sovereigns complete the general framework of issuers covering circa the remaining 40%, even if they increase their share at an increasing pace (CBI, 2020).

**Figure 7** Use of proceeds sectors in 2019



Source: CBI

Proceeds were allocated mainly to energy and buildings sectors (both of them have approximately 30% as a share) and transport and water sectors followed with 20% and 9%. The missing 10% is divided among other sectors (waste, land use, industry, ICT) or displays the unallocated amount. Looking into details, in Europe the allocation of energy was 34%, displaying a drop of 11% relative to 2018, but the transport and water increased by 6% respect to 2018. In the Asia-Pacific region, both buildings and transport grew but funds devoted to water and waste infrastructures continued to drop. Finally, in North America, proceeds were used in buildings for almost half of the overall allocations at expenses of transport and water that suffered a decrease with respect to 2018, especially transport (CBI, 2020).

In the subsequent paragraphs, global market will be broke down in several sub-areas in order to give a deeper analysis of each market in developments and trends.

## 2.2 Market development and functioning in the EU

As reported above, the EU green bond market has played a leading role in the development of the global market and still today it accounts for about the 45% of the overall growth of the market in the 2019. With respect to markets in other countries, the EU market has grown better because it relies on a well-established financial system. In addition, such market has seen new entrants and strengthened

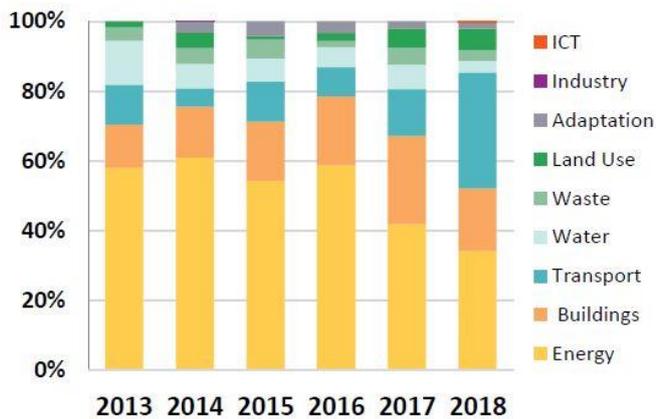
political support from the EU institutions. Nonetheless, there are substantial differences in the development of markets within each country usually related to the different policies aimed at the develop and support of bond market ranging, for instance, from strong markets in northern Europe countries to Bulgaria (that has never issued one labelled as green up-to-date).

To have an idea on the size and the relevance of the EU market, it is enough to think that 145 entities have issued green bonds in Europe accounting for a third of the global market. Among issuers, the government-backed entities, local governments and sovereigns category holds the largest share of overall issuance (40%), followed by non-financial corporates, especially from energy and property sectors, (about a third of comprehensive supply) and financial institutions that account for about the 25%; ABS issuance has a very marginal role. It is noteworthy to say that non-financial firms are used to issue bonds with medium- to long-term tenure (from five-ten years to perpetual), whereas financial institutions finance themselves through short-term bond (up to five years). However, securities with an expiration up to ten years prevail being the 70% of the comprehensive issuance.

Not surprisingly, the EUR-denominated issuances are about the 75% even if several European green bonds have been denominated in fourteen different currencies such as the green bond issued by Enel denominated in Brazilian real. Another feature of the EU green bond market is that over half of the deals are below EUR100m, implying the presence of small and medium size issues, both from private and public sector. Moreover, most bonds labelled as green are in line with the GBP or they are integrated with other policies; more than 98% of green bonds in the EU market have external review and a vast majority also has a second party review, but certification is not so widespread even if in the 2017 certifications rose reaching EUR4.2bn (CBI, 2018).

With respect to the allocation of proceeds, it does not present a consistent diversification. Indeed, EU issuers have contributed a large part of green bond revenues to the energy market. Over recent years, though, the proportion of proceeds provided to the energy sector in the overall balance has declined as the volumes channelled into buildings (on the overall proceeds earmarked to buildings, issuers from the property sector have a share of about 30%) and transport have increased, as reported in the graph below. It is reasonable to assume that, in the future, the transport sector will receive a larger share of proceeds due to the presence of plans to enlarge the railway network all over the Europe.

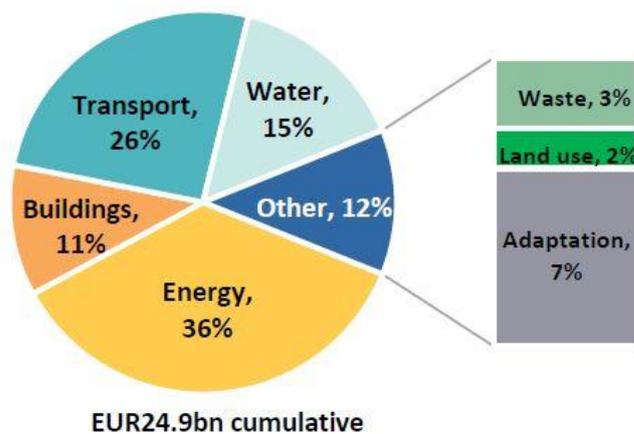
**Figure 8** Allocation of proceeds in EU



Source: CBI

Since 2010, the year when the first public sector issuance happened through the Norwegian state-owned lender KBN, there has been an increasing-pace and durable flow of issuance from local governments (i.e. cities, municipalities, ... ) and government-backed agencies (such as financial institutions, energy and rail companies). So, sovereign bonds have boosted the volumes recently, especially in France and north-Europe countries, where policies in support of climate are adopted. Government-backed Scandinavian and French institutions have made a relatively significant commitment to the issuance of green bonds. Total municipal and sovereign-owned issuance exceeds the combined sum collected by sovereigns and local authorities at the end of the first quarter of 2018: EUR24.9bn compared to EUR20.7bn. As the graph below shows, proceeds raised through government-backed issuances concern primarily investments in the energy sector (about 36%), transports (26%) and water management (15%).

**Figure 9** Government-backed entities allocation of proceeds



Note: Percentage total exceeds 100% due to rounding.

Source: CBI

Besides, the financial institutions among government-backed agencies have a variety in combining allocations: they serve as aggregators for smaller funding needs. As to the date of the report, European financial institutions have achieved an overall issuance of green bonds equal to EUR48bn, mostly senior unsecured bonds. Early issuing by financial institutions made the distribution of proceeds more diverse. The mix has shifted to feature an increasing share of real estate financing. Banks primarily used senior unsecured bonds to finance hypothecary loan schemes for energy-efficient homes and commercial properties, but also covered bonds.

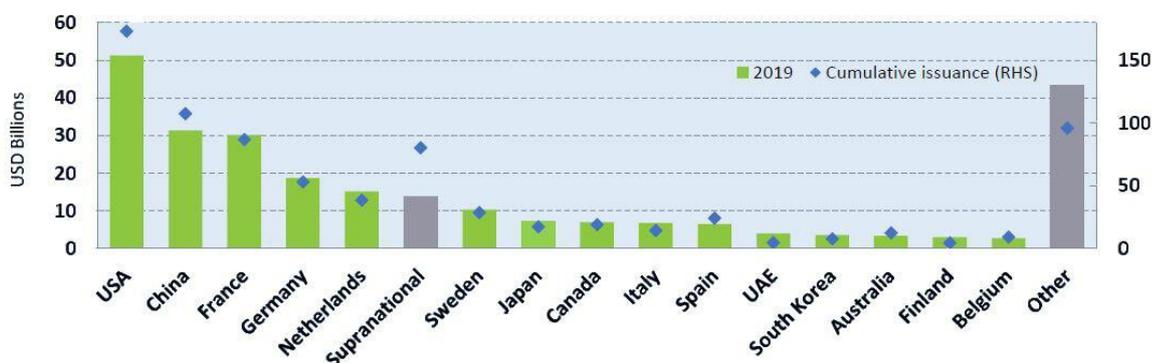
It is noteworthy to say that European banks, such as Credit Agricole and HSBC, are among the top ten underwriters (according to Thomson Reuters’ annual green bond underwriter league), actively supporting issuance. In addition, as said in the first chapter, several European stock exchanges have segments entirely dedicated to green bonds in order to provide them with a greater visibility and to foster the transparency and market integrity of such bonds<sup>5</sup>.

### 2.3 Market development and functioning outside the EU

Having analysed the market within the European boundaries, now the dissertation expands to the rest of the world.

According to the 2019 green bond market summary report by CBI, during 2019 the Asia-Pacific market held approximately 25% of the global volume, whereas the North American market accounted for 23%. Nonetheless, United States was the country that, during 2019, issued the greatest volume of green bonds with a corresponding value of USD 51.3 billion, followed by China and France. However, both regions recorded a substantial growth with respect to the previous years.

**Figure 10** 2019 green bonds issuance 15 top countries



Source: CBI

<sup>5</sup> All data in the paragraph are taken from CBI, *The green bond market in Europe*, 2018

Still in 2018, USA was the top country for value of issuance and cumulative issuance but together with Canada, they incurred in a negative change in overall green bond issuances by region with respect to 2017, even if United States counted for the 34% of issues among developed markets in 2018 and Canada for the 3% (corresponding to CAD 5.5 billion).

For what concerns Canada, in 2018 municipalities gave the greatest contribution to comprehensive issuances (42%), particularly from the Province of Ontario, that since 2014 has issued green bonds for a total value of CAD 3 billion. Moreover, Canada Pension Plan Investment Board launched the largest green bond of 2018 (CAD 5.1 billion), being also the first green bond from a pension fund globally. Revenues raised were earmarked especially to the clean energy sector (32% of CAD 15.2 billion cumulative) and the 30% is allocated to programmes and projects related to transports.

Furthermore, the green bond market in Canada has a good track record of external reviews. In fact, about 89% of issuance are subjected to an external review split up in 78% of volume benefit from a second party opinion, 8% from a rating and 3% from certification under Climate Bonds Standard. Finally, the majority of Canadian green bonds is denominated in Canadian dollars (64%, according to 2018 data provided by CBI report) and almost 79% have a tenor less or equal than 10 years.

As said above, during 2019, Asia and Pacific region held a share of comprehensive issuances equals to 25%, with a growth respect to the previous year of about 29%. In addition, the area experienced a shifting in the nature of issuers during 2019, with a rise in non-financial corporate issuance, combined with a decrease in financial corporate and development bank activities. About revenues, the energy sector holds the greatest percentage of proceeds allocation even if allocations to building and transport sectors increase due to Chinese issuers that invest in those categories of assets and projects.

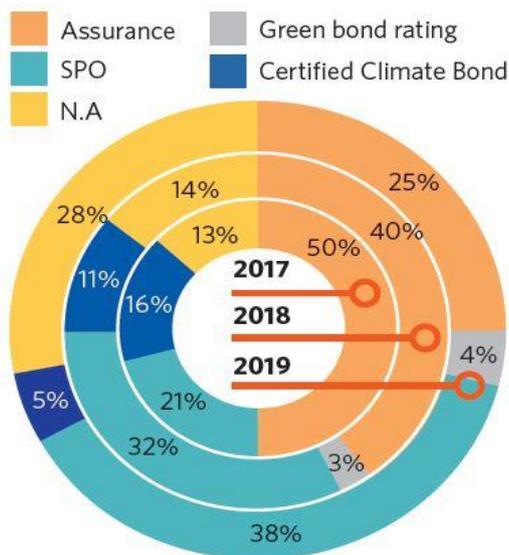
Among the Asia and Pacific countries that issue green bonds, the role of the leader is cover by China. In 2019 it also listed second, behind the United States, in top issuers ranking, with a yearly contribution of USD 31.3 billion, considering only issuances that are in line with international definitions of green (CBI, 2020). However, there are still differences between China's local green bond guidelines and the international ones, especially for what concerns the eligibility and disclosure activities related to green projects. The international standards pay greater attention to prevention and adaptation to climate change on the meanings of certain programs, while the domestic ones of China still accentuate environmental benefits, such as reduction of pollution and greenhouse gas emissions. If issuances aligned with Chinese definitions are added up in the comprehensive amount, the country becomes the world largest issuer, overtaking the United States, reaching a volume issuance for 2019 equals to USD 55.8 billion (RMB 386.2 billion).

New trends in China's issuer styles profile have characterized in 2019. The most significant is the strong growth in total green bond volume issued by non-financial corporations, which increased by 54% on a yearly base, representing 37% of total issuance volume in 2019. Consequently, non-financial corporates became the largest type of issuer in 2019, overcoming financial corporates, which had led the issuances since 2015.

The distinction between the two definitions (CBI aligned one and China's local guidelines) also persists when the use of proceeds is analysed. Relying on data provided by CBI in its "China Green Bond Market 2019 research report", following the CBI's definitions, energy category detains 28% of proceeds raised, behind the transport sectors that held the largest share (37%) of revenues; the latter is the only sector that shows a year-to-year increase since the borne of the market. Following China's domestic definition, clean transport and clean energy sectors have almost the same (greatest) share of proceeds allocated but with a substantial difference: transport sector recorded a drop from 30% of 2018 to 26% of 2019, whereas energy sector has increased its share from 20% of 2018 to 27% of 2019.

Differently from Canada, with a solid track record of external review, in China the 28% of volumes are not subjected to an external review; a percentage that is increased from 2017, 13%, to 2018, 14%, to 2019.

**Figure 11** China external review types



Source: CBI

However, among reviewed, the most widespread is SPO (38%) and assurance (25%).

Finally, it is relevant to notice that, in 2019, in the Chinese domestic green bond market, 60% of cumulative bonds had a tenor up to 5 years and only a third had a tenor ranging from 5 to 10 years.

In the Asiatic continent, also Japan reported a continuing-pace growth of its green bond market since 2014 up to 2019 when it notified a substantial growth of 70% with respect to the previous year, establishing itself as the 7<sup>th</sup> country worldwide for volume issuance in 2019 (JPY 786.7 billion). From a cumulative point of view, Japan ranked 9<sup>th</sup> globally, with issuances for JPY 1875.2 billion or USD 17 billion. The green bond market is dominated by financial corporates, accounting for half the cumulative issuance (JPY 938.8 billion), and non-financial corporates with 21% (JPY 397.7 billion). Those two categories dominated also the 2019 issuances panorama for total issuances of something less than 600 billion; in addition, with respect to 2018, agencies backed by governments have strongly expanded the number of their issuances (JPY 24.5 billion in 2018 vs JPY 222.4 billion in 2019) obtaining a 14% as the market share of comprehensive issuances.

In the process of revenues allocation, the greatest cumulative percentage (38%) goes to the building sector, reporting a substantial difference with the two countries previously analysed. Energy and transport sectors follow with a smaller share of 29% and 25% respectively.

From the standpoint of external review, Japanese green bond markets recorded a notable growth from 2014, when less than JPY 100 billion of green bonds have an external review (only SPO), to nowadays: in 2019 90% of issuances had external reviews, including SPO, Certificate Climate Bonds (CCB), and with rating only. Among SPO providers, Sustainalytics is the most widespread. Finally, the majority of Japanese green bonds is denominated in Japanese yen (53%, according to 2019 data provided by CBI in “Japan - green finance state of the market”); bond with a tenor less than or equal to 5 years is preferred by 57% of domestic issuers, while the range from 5 years to 10 years is preferred only by the 27% of issuers.

As of the end of the first half of 2019, Australia was the third country of Asia-Pacific region for cumulative domestic green bond issuance behind China and Japan, reaching AUD 15.6 billion, and 9<sup>th</sup> globally. State governments have given the greatest contribution to increase comprehensive issuances as to the end of June. A larger share of proceeds (43% cumulative) has been allocated to low-carbon buildings also thank to strong green building certification schemes as NABERS (an initiative by the government of Australia to measure and compare the environmental performance of Australian buildings and tenancies) and green star (voluntary sustainability rating system for building<sup>6</sup>).

Just like Canadian and Japanese green bond markets, also the Australian market presents a very good percentage of external review at the issuance (83%), reaching a 100%-level of disclosure after issuance as symptoms of market best practice. Lastly, Australian onshore green bonds are mainly

---

<sup>6</sup> Definitions of NABERS and green star are from <https://en.wikipedia.org/wiki/NABERS> and [https://en.wikipedia.org/wiki/Green\\_Star\\_\(Australia\)](https://en.wikipedia.org/wiki/Green_Star_(Australia))

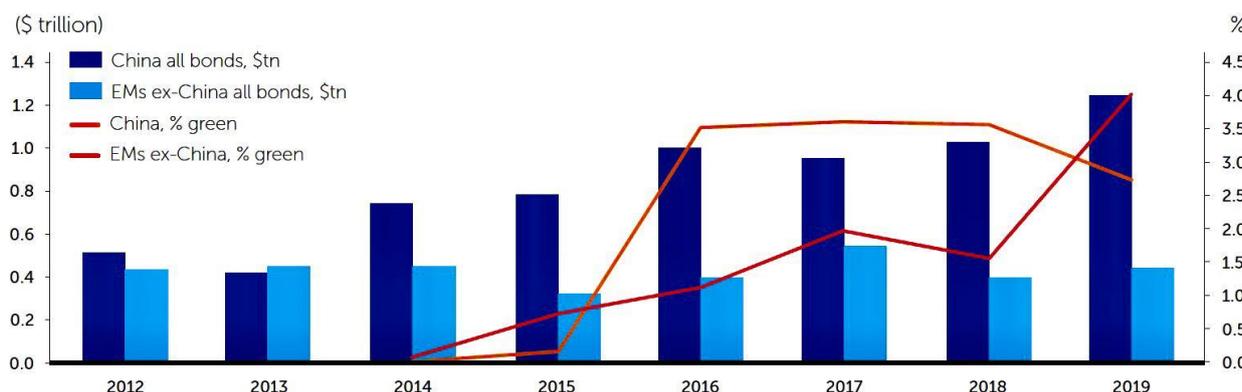
denominated in Australian dollar (59%) and, surprisingly, in euro (28%); differently from Canadian and Japanese issuers that prefer bonds with medium-term, Australian issuers like green fixed-income instruments that have a term less to 5 years but they do not disdain bonds with a term up to 10 years.

## 2.4 Markets in developing countries

The remaining green bonds market needed to be considered is the one related to developing countries. It has not been a long time since green bonds issuers have entered the global market but, despite it, they have been able to benefit from the huge demand for green bonds securing capital to every-country investors. The development of issuers from emerging countries is particularly attributable to the increase in awareness and know-how about green bonds among investors and issuers.

Nowadays, the cumulative amount of issuances reached USD 168 billion thanks to the 21% increase (USD 52 billion) relative to 2019.

**Figure 12** Emerging Market Green Bond Issuance 2019



Source: Amundi emerging market green bond report 2019

However, since China, the greatest emerging-economy green bonds issuer, registered a negative growth of 7%, other developing countries have driven the comprehensive growth in 2019: India was the country with the largest-volume issuance and then Chile and Poland. In addition, new countries have joined the market, such as Ukraine and Ecuador, leading to a more geographic-diversified framework.

In the global emerging market green bond issuance, East Asia and the Pacific region (EAP) maintains the leadership, both for volumes and number of issuers, with China that remains the larger regional issuer. Outside China, EAP played a leading role in the development of the green bond market. Southeast Asian countries issuances have reached USD 8.1 billion in 2019 nearly doubling from 2018, when cumulative issuances were USD 4.1 billion. Since 2016, when first ASEAN (Association of Southeast Asian Nations) green bond was issued by Philippines-based utility

company, overall issuance values USD 13.4 billion, accounting today for 3% of global total of issuances. Over 2019, a significant number of countries has intensified issuances: Indonesia with another USD 750 million-sovereign green bond, Malaysia with a green sukuk<sup>7</sup>, and Philippines and Thailand with several financial institutions and corporations. Last but not least Singapore, where considerable deals have been closed during the last year together with non-financial corporates that approached green finance; all of this contributes to establish Singapore as the regional leader for 2019, with a 55% of share. Behind Singapore, Philippines has 19% share, the second biggest, and Indonesia, that has reduced its share to 10% despite President Jokowi's wide public support for sustainable development policies.

In the region, green bonds revenues were mainly earmarked to the buildings (34%) and energy (33%) sectors, aligned with these being the main global categories, followed by transport and water. But the proceeds distribution is substantially different among countries with building category leading in Singapore, energy in Philippines, Thailand and Indonesia, while in Malaysia building and energy are roughly equally split.

Regional issuers are prone to favour US dollars for their green bond issuance however, with 41% issued in local ASEAN currencies, national markets offer lucrative investment options for domestic investors and international funds seeking to invest in local currencies. Moreover, with 13 green bonds issued with a short-term tenor (up to five years) in 2019 (two in 2017, four in 2018), the ASEAN markets prefer to issue short-dated green bonds. The use of longer-tenor green bonds is also increasing, however, with nine bonds that have a maturity of 5-10 years (one in 2017, five in 2018) and six with a longer date (three in 2017, four in 2018), predominantly sukuks.

With respect to independent reviews, all bodies that supervise on the use of proceeds, both at regional and global level, ask for an independent review. To meet this criteria, most ASEAN green bonds are released with an external evaluation, although the majority of green loans in Singapore and two Malaysian sukuks have not. Probably because of the related ease of gathering a second-party opinion and the broader selection of suppliers, SPO are to the highest degree the most used form of review, accounting for 63% both in 2019 and cumulatively.

The second market for cumulative issuances from 2012 is the one relative to the Latin America and Caribbean (LAC) region, accounting for 7% of the total. Since the first green bond issued in 2014 in Peru, LAC experienced a continuing growth up to 2017 when the market registered a 133% growth with respect to the previous year, particularly thanks to Brazilian issuers (they held 69% of comprehensive issuances for such year). Further, despite in 2018 a global slowdown of bonds

---

<sup>7</sup> According to the definition provided by CBI, sukuk (the plural of sakk) are Islamic Shari'ah compliant securities backed by a specific pool of assets

issuances (also vanilla ones), during the first half of 2019 issuances tripled relative to 2018 and increased by 40% from 2017, reaching USD 3.7 billion. The picking-up of the market in 2019 is particularly attributable to Chile with its two sovereign bonds: USD 1.4 billion in June and EUR 861 million in July.

Even though only eight LAC countries have issued green bonds with Brazil dominating (41% of overall issuances) and then Chile (25%), there are substantial differences in issuers among countries; in addition, in some countries, public sector issuances prevail while in other private ones are predominant. In Brazil, for instance, non-financial companies have the leading role, in Chile sovereign agreements prevail, Mexico is dominated by development banks and Argentina by state governments.

As for the global emerging countries green bond market, proceeds raised through green bonds issued in the LAC region are mainly allocated to renewable energy sector having such a greater share (44%) than globally (35%). Behind the energy sector, both transport and land use with 20% of cumulative issuances. It is noteworthy to say that the latter, together with the industry sector, is more financed in LAC countries than in the rest of the world.

More than 80% of green bonds issued within south American countries are denominated in hard currencies because of the will to send bonds worldwide. In particular, due to the strong bond with the USA, 70% of cumulative issuances in LAC are denominated in USD, especially for large deals, dominating across all countries. An exception is Colombia that has issued five green bonds, all denominated in Colombian Peso. EUR-denominated bonds are much less common but, they have a 12% of the market amount. As for Canadian, despite with a smaller share, 61% of LAC issuers prefer bonds with a tenor less than or equal to ten years (21% up to five years, 44% ranging from five to ten years). A substantial difference with respect to the rest of the world is that LAC long-dated green bonds have a greater percentage (21%); the reason behind it is that the Chile USD-denominated sovereign will expire in 2050.

Just like the other regions and countries analysed above, also in LAC countries almost all the issuances (90%) have reviews from SPO (largest practice with 57%, assurance, green bond ratings, or Certification under Climate Bonds Standard).

A relatively different situation is the one of the African continent. Indeed, it is going to be the worst impacted by climate change continent. The growth of the green bond market has been witnessed in the continent's economic hubs with several countries, among which Kenya, Nigeria and South Africa displaying immense potential to be involved in and to lead the growth of the business. Properly, in December 2017, Nigeria was the first African country to issue a sovereign and the fourth in the world. Also in 2018, Nigeria carried on initiatives to enhance the greening process, like the Nigeria

Green Bond Market Development that aims to help corporate and/or non-sovereign green bond issuance and develop a well-established domestic green bond market. After the success of the issuance of 2017, in 2019 a second green bond was issued by Access Bank, one of the biggest commercial banks in Nigeria; proceeds were mainly addressed to the clean energy sector and water infrastructure.

Moreover, South Africa is perceived to have the greatest green bond market of all the African region. From 2014, when the first green bond of the nation was issued by the city of Johannesburg, to 2017, with the city of Cape Town that issued the second green bond being also the first one to be listed on the Johannesburg Stock Exchange. This issuance was a stunning success due to a subscription that was 4.3 times higher than required. This result has been a clear signal of a strong demand for African green bonds from the investors.

Finally, also Kenya is seen as a significant African destination for investments in renewable energy because of the plans of the Kenyan government to move towards a low-carbon society, like the Green Economy Strategy and Implementation Plan (GESIP) of 2013-2030. A relevant feature of the GESIP is the recognition of green finance tools such as green bonds to help the country in the transition mechanism. Then, in 2017 the Kenyan Green Bond Programme (GBPK) started, as a consequence of the GESIP. A partnership with several stakeholders, among which CBI and the Central Bank of Kenya, was at the core of the GBPK, creating an advisory committee to shape new policies and regulations to increase the number of investors.

Although the first Kenyan green bond from a corporation was issued in 2019 with a principal of USD 48.45 million<sup>8</sup>, additional work should be done in order to develop the Kenyan green bond market and more resources have to be addressed to domestic participants in order to gain skills and expertise on green.

---

<sup>8</sup> <https://www.reuters.com/article/kenya-bonds-green/kenya-approves-issuance-of-first-green-bond-idUSL8N25B1TQ>

## Chapter 3 JSC Russian Railways

### 3.1 Russian green bond market

Like in other developing economies, in terms of policies regarding green finance, Russia is some years behind developed-economies counterparty. Nonetheless, this gap is rapidly filling up.

Despite only with the updates to the listing rules of the Moscow Exchange (MOEX) that enter into force in August 2019 a segment (Sustainability Sector) with the aim to finance environmental and social sustainability projects has been created, in December 2018 the first green bond from a refuse-processing listed company named Resursosberezhenie KhMao (RSB – HMAO) made its appearance with a nominal value of RUB 1.1 billion (USD 16.4 million). Although the bond had a relatively small size, the transaction denoted the long-awaited entrance of Russian issuers into the green bond market and lays the foundations for deals of bigger size, including Eurobonds<sup>9</sup>. Revenues raised has been earmarked to the installation of a waste management in the west of the Siberian region, resulting in line with GBP 2018.

Then, the first green instrument on the Sustainability Sector of the Moscow Exchange appeared in November 2019, with a green bond issued by Center-invest Bank having a size of RUB 250 million, due to one year. As disclosed in the opinion issued by RAEX – Europe, the same second party opinion provider of the RSB – HMAO green bond, proceeds were used to finance projects related to the renewable energy, energy efficiency, and clean transportation sectors, in line with the GBP 2018. More precisely, revenues have financed and refinanced pending lending activities related to the categories cited above.

However, there are several reasons why the Russian market is moving toward the development of green finance. The first explanation is attributable to the will of both issuers and the exchange to look for new kind of investors. Although non-Russian investors hold approximately 30% of Russia's listed and traded sovereign ruble bonds, this percentage is only a tiny portion of overall corporate ruble bond market. Moreover, global investors are strongly interested in Russian corporates green bonds as the case of JSC Russian Railways one demonstrated<sup>10</sup>: more than 70% of such bond was allocated to investors from Asia, Europe and the United States.

Another rationale behind the green bonds spreading is the massive presence of heavy industries and companies related to the oil and gas industry (the latter-industry companies account for approximately half of the market capitalization of the benchmark MOEX index). Then, all those companies are

---

<sup>9</sup> A Eurobond is a debt instrument that's denominated in a currency other than the home currency of the country or market in which it is issued; from <https://www.investopedia.com/terms/e/eurobond.asp>

<sup>10</sup> The subsequent paragraphs will be entirely devoted to analyse such bond

facing several environmental challenges to reduce their impact that requires conspicuous investments, so green bonds could be a useful instrument for following years. This greatest commitment toward the development of eco-friendly policies is reflected in a stronger interest in ESG issues by all companies. It is noteworthy to say that there are firms related to those industries that have obtained particular loans (sustainability-linked loans), among which one, in April 2019, that had interest rates linked to the borrower's ESG rating and another one in September 2019 whose coupon payments varied according to many ESG targets.

Finally, also the government is carrying on plans to boost green bonds issuances. In 2018 President Putin has set up the "Ekologiya", an environmental investment plan that should receive 4 trillion of ruble but, as to date, only 275 billion of ruble were from State budget. The remaining should come through investments from private, including green bonds. These bonds were also subsidized by the government that has promised a refunding up to the 70% of the interest that issuers have to pay to investors.

But, despite the reasons explained above, potential future Russian green bond issuers have to deal with several difficulties and hitches.

First, the current legislation lacks for what concerns completeness and uniformity. Although the presence of supranational international standards like ICMA GBP, several countries (like China, as reported in the previous chapter) develop their own guidelines in order to adapt previously written rules to domestic markets. Russia is one of those countries. In fact, the Central Bank of Russia is working at a green finance "roadmap" to implement tailor-made rules for Russian market. But actually, due to such an incomplete legal framework for what concerns green bond, Russian companies that were looking for green investments may have been hindered.

Another hitch regards the lack of a well-developed non-financial reporting scheme that could restrict the easiness with which Russian green bonds are traded. Given that when revenues from a green bond issuance are raised they should be allocated according to their green bond framework, issuers are obliged to disclose and report if they have earmarked proceeds complying with the framework. If investors are not able to monitor this process, they are likely to invest with difficulty in such kind of securities. For this reason, several steps are on the way in order to develop and enhance the non-financial reporting scheme. Nonetheless, the majority of Russian public companies do not collect, analyse and disclose voluntarily such data due to a likely increase in their cost if such practice would be implemented.

A third difficulty may be attributed to the condition of the Russian debt market, mainly due to the sanctions that have been affected by the nation. Such sanctions have given a certain contribution to

the creation of an unstable debt market for what concerns new issuances, leading to a consequent decrease in the will of investors to try new kind of asset.

As fourth and last disincentive, there is a considerable public relation risk related to green bonds; particularly as issuers who advertise as green is going to be probably subject to a continuing examination. Although in the case that proceeds fail to be used for a stated green project, bondholders are immediately repaid of the amount they have invested, it is likely to end up with a harsh public relation repercussions. Moreover, even if proceeds are doubtless earmarked to green projects, media targets less green facets of the issuer's activities to criticize the issuance or degree of greenwashing<sup>11</sup> suspicions. So, considering the increasing appetite from foreign investors for green bond investment opportunities, and the insistent need for firms in the country to carry on and enhance their ESG and sustainability credentials, the amount of money generated by green bonds allocated to clean energies and other green initiatives may lead to a strong increase. Besides, also the development of new financial tools and products related to sustainable finance is becoming a key trend in Russia. Examples are transition bonds, green striped bonds as well as the sustainability-linked loans and bonds cited above.

Finally, sustainable finance would eventually grow dramatically in Russia in the future, considering that climate change and ESG are becoming too relevant and omnipresent issues and the country is so relevant in terms of environmental impact and forecasts related to economic growth. It is primarily because of the intense emphasis on fossil fuel-intensive oil and extractive industries that shift or the sustainability-linked loans may be of special significance.

### **3.2 JSC Russian Railways action for environment protection**

Joint Stock Company Russian Railways (RZD) is Russia's biggest operator of rail transport services and one of the world's most sizeable shipping company with its 85500 kilometres rail network and being the owner of all related infrastructure as well. In fact, as of December 2018, it ranks as the third-longest railway network worldwide for its length and third for passenger turnover, measured in passenger per kilometres<sup>12</sup>. In addition to the rail infrastructure, the Company also controls and manages almost all of Russia's locomotive; besides, it is among Russia's largest owners and operators of freight rolling stock and carries virtually all long-haul passengers (to destinations over 200 kilometres) on the rail. Suburban rail passenger companies managed mainly trains with destinations below 200 kilometres. These companies are either divisions of the Group or organisations of which

---

<sup>11</sup> From <https://www.investopedia.com/terms/g/greenwashing.asp>. Greenwashing is the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound.

<sup>12</sup>JSC Russian Railways. (2020). *Green Bond Report*. JSC Russian Railways.

the Group holds a minority stake. The group is also responsible for railway infrastructure construction and maintenance services, like rolling stock repair.

Since December 2007, after fourteen years from its foundation, the state-owned railways company is a member of the UN Global Compact, a voluntary initiative based on CEO commitments to implement universal sustainability principles and to take steps to support UN goals<sup>13</sup>, being an active participant. Moreover, over the years, RZD has adopted several policies and rules in order to achieve a sustainable development, with the aim to obtain an halving of its total emissions in 2030, including almost sixteen laboratories all over the country that test trains and report emissions in several locations, and annual reduction targets for plastic and water use and emissions. In addition, the company carries out an initiative consisting in ongoing tree-planting: 351900 trees will be planted during the 2020 along the railway network. Furthermore, a “green day” on a monthly base is established in order to increase awareness of clients and employees in environment-related themes. For what concern the current year, the company has budgeted RUB 4 billion (USD 57.45 million)<sup>14</sup> in order to enhance its environmental performance and the safeguard of the nature. Up to the end of 2020, emissions of unhealthy substances are going to be decreased by 13000 thank to air protection measures. Moreover, in pursuing the energy-saving and energy efficiency programme, Russian Railways will cut down CO<sub>2</sub> emissions by 714700 tonnes and 797 million kWh of electricity and 65600 Gcals of thermal energy are going to be saved. Being the management of waste in charge of the company, a huge quantity of waste is going to be transferred and 401 waste-storage venues will be set up.

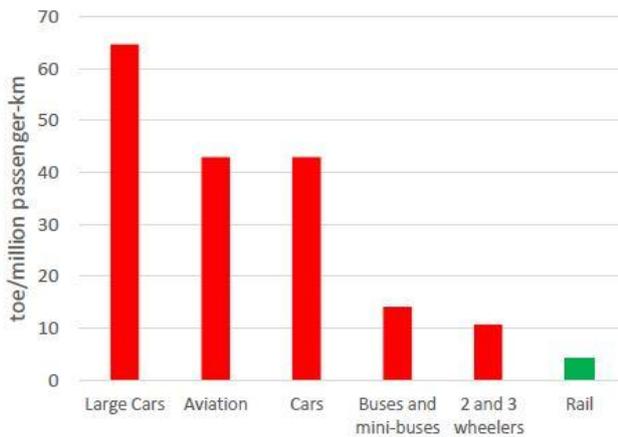
Continued investment in its asset base enables Russian Railways to achieve these reductions, and provides a secondary benefit by attracting passengers to trains and moving away from transports that have a greater harmful impact on the environment. Indeed, move people on train is the most valuable mode of transport (which accounts for 9% of overall activity but just 1% of global energy claim) in terms of both energy usage and CO<sub>2</sub> emissions per passenger per each kilometre as well as decreased reliance on diesel fuel by continuous electrification of railway lines, as the chart below reports.

---

<sup>13</sup> <https://sdgresources.relx.com/united-nations-global-compact>

<sup>14</sup> <https://www.railwaypro.com/wp/rzd-to-continue-its-environmental-conservation-plans/>

**Figure 13** Global average energy intensity of different transport modes (passenger transport), 2017



Source: JSC Russian Railways Green Bond Framework

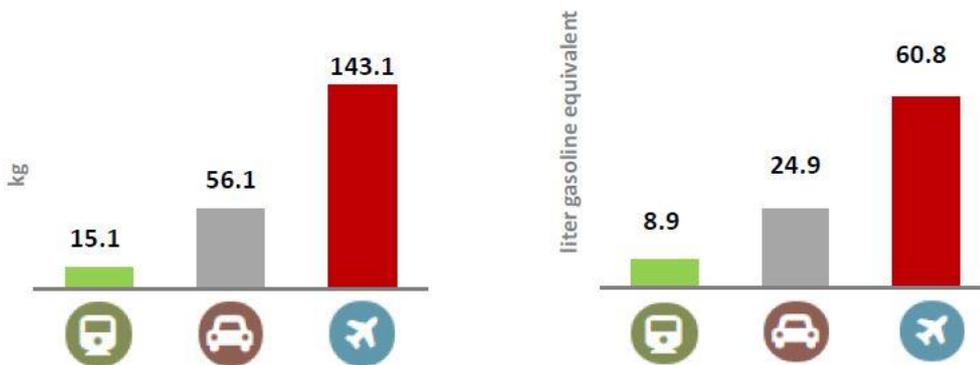
In addition, in 2018, the company accounted only for 1% of emissions related to all greenhouse ones in Russia with a reduction in overall air pollution equals to 45.7% with respect to 1990; from 2011 to 2017, a decrease by 33% of harmful substances and by 54.6% of polluted wastewater has been registered (Töre, 2018).

Therefore, RZD claims that its business model, as it is based on the ongoing growth of commuter mass transit capability and the expanded supply of electricity-fuelled trains, has the potential to give a substantial contribution to the decarbonization of the economy, and intends to give prospective green bond holders an incentive to promote low-carbon transport asset financing

### 3.3 Green bond framework

In its plans related to environmental issues, JSC Russian Railways is gradually getting rid of older and diesel-powered locomotives, shifting to electrify its activities. The company plans to add to its fleet 1000 more new electricity-powered locomotives, called “Lastochka”, with an overall cost of approximately EUR 2 billion. Designed by Siemens Desiro, “Lastochka” train resulted in the lowest emission of CO<sub>2</sub>, approximately 6 times less than that of the cars, and consumption of energy, compared with cars and trains.

**Figure 14** Carbon dioxide emissions (CO<sub>2</sub>) and energy resource consumption



Source: Russian Railways Green Bond Report May 2020

To raise money in order to finance and refinance the purchases of those locomotives, in May 2019, through its Irish subsidiary RZD Capital, the company issued an 8-year green bond listed on Euronext Dublin market, the first green bond by the company and the first one issued abroad by a Russian company. As the table 2 reports, the bond is EUR 500 million sized, expiring in May 2027. During the roadshow, its coupon rate was set at approximately 2.5% but, due to strong investor interests, the price was reduced at 2.2% at the launch day, the lowest coupon rate ever from a Russian issuer up to such date. The issuance reported a large participation with the order book that reached EUR 1.7 billion (over 3.5x subscription)<sup>15</sup>.

**Table 2** Features of the first green bond

<b>Issuer</b>	JSC Russian Railways
<b>Deal size</b>	EUR 500 million
<b>Maturity date</b>	23 May 2027
<b>Tenor</b>	8 years
<b>Coupon rate</b>	2.2%
<b>Bond rating</b>	Baa2 (Moody's) / BBB- (Fitch)
<b>Bookrunners</b>	UniCredit, JP Morgan, VTB Capital
<b>Listing</b>	Euronext Dublin

Source: Personal elaboration on data from Russian Railways Green Bond Report May 2020

The issuance was approved and accredited by the CBI in compliance with ICMA's Green Bond Principles. Indeed, this was the first Certificate Climate Bond from Russia. Verification on the correct

<sup>15</sup> <https://bondsloans.com/news/case-study-russian-railways-eur500mn-issue-is-russias-first-green-eurobond>

use of proceeds and second party opinion was entrusted to Sustainalytics in the post-issuance phase. In addition, Sustainalytics should review if RZD's green bond complies with the requirements set out in the most recent version of Climate Bond Standard for what concerns low carbon land transport criteria in the phase before the issuance. Indeed, in the pre-issuance verification letter, the second-party-opinion provider states that “nothing has come to Sustainalytics’ attention that causes us to believe that, in all material aspects, Russian Railway’s green bond is not in conformance with the Climate Bond Standard's Pre-Issuance Requirements” (Sustainalytics, 2019). This means that the pre-issuance criteria have been respected. Moreover, also the issuer has several responsibilities before the green bond is issued. In fact, Russian Railways was responsible for providing information and documents relating to:

- The details concerning the selection process for the fully electric passenger trains;
- The details of the fully electric passenger trains;
- The management systems for internal processes and controls for clean transportation including tracking of proceeds, managing unallocated proceeds and earmarking funds to Nominated Projects;
- The details of commitments for reporting before issuance, including: investment areas, management of unallocated proceeds and frequency of periodic Assurance Engagements<sup>16</sup>.

Also in the post-issuance verification, Sustainalytics found that the issuance complied with the “Part A: General Requirements, Part B: Eligible Projects & Assets, and Part C: Requirements for Specific Bond Types” sections of the Climate Bond Standards Version 2.1 . In this case as well, the issuer must deliver reliable records and reports relating to the specifics of the financed projects, including an overview on the projects, the overall cost of developing each project, and sums paid out.

After the issuance of 2019, JSC Russian Railways decided to launch a new green bond in May 2020, despite the outbreak of coronavirus pandemic, in order to continue the program of finance and refinance the purchase of “Lastochka” electricity-powered trains. The program is strictly in line with the CBI green bond principles, which enables linking the notes to different international ESG indices. Therefore, the company made this issuance just before the bond market for emerging country massively dropped due to the fears related to the covid-19. With this operation, the second-RZD green bond has been the first Swiss franc-denominated debt security, sized CHF 250 million, and listed on the Swiss Stock Exchange (SIX).

---

<sup>16</sup> Sustainalytics. (2019). *JSC Russian Railways. Pre-issuance verification letter*. Sustainalytics

**Table 3** Features of the second green bond

<b>Issuer</b>	JSC Russian Railways
<b>Deal size</b>	CHF 250 million
<b>Maturity date</b>	3 May 2026
<b>Tenor</b>	6 years
<b>Coupon rate</b>	0.84%
<b>Bond rating</b>	Baa2 (Moody's) / BBB- (Fitch)
<b>Bookrunners</b>	UBS, JP Morgan, VTB Capital
<b>Listing</b>	Swiss Stock Exchange SIX

*Source:* Personal elaboration on data from Bond & Loan, 2020.

During the roadshow in Zurich, the bond was initially presented with a price ranging from 0,873% to 0.973%, but in the end, the coupon rate has been set at 0.84%, definitively the lowest coupon in Russian fixed income market.

By this extent, in both issuances, the company has been successful, meaning that investors reserve a particular attention to ways of raising money trough eco-friendly instruments, especially in developing countries as Russia where raw materials abound.

## Conclusion

In the analysis conducted, the report has described the past and current state of the green bond framework, providing details on both what a green bond is and in which market with such features they are issued, listed and traded. Then, it has been decided to analyse the singular case of the two green bonds issued by the state-owned Russian railways company inasmuch it is particular that a firm located in a country that is developing a sort of green consciousness, filling the distance with more developed countries at a fast pace and without any particular difficulties.

Precisely, the first chapter has been written down in order to give a comprehensive understanding of what those securities are, how they work and which are the main stock exchanges where they are listed and traded.

After that the features and attributes of the green bonds are identified, the second chapter is thoroughly dedicated to markets all over the world. Indeed, after having analysed how green bond markets are developing, it spans from such markets in Europe to markets outside Europe. The study grounds on differences concerning mainly the size of issuances (cumulative and relative to specific years), and in which currencies they are mainly denominated, for instance. The remaining part of the chapter figures out how the dynamics that are leading developing countries to carry out and enforce those particular securities in order to fund and re-fund programs and activities with low-carbon emissions and eco-friendly. This last chapter-two paragraph has been particularly useful to introduce the third chapter. Indeed, the chapter opens with the understanding of the state of the green bond market in a developing country such as Russia in order to give an overall framework within JSC Russian Railways had issued its bonds. The commitment of the company towards the environment is displayed in the fact that it set guidelines in order to reduce the consumption of energy and pollution. The issuances of the two green bonds, described in the subsequent paragraph, perfectly matched such engagement as a part of the strategy of the company.

So, the analysis, as summarized above, has been written in order to provide a detailed understanding of the Green Bond market's current situation, its key criticalities, and its possible future developments. At the base of the dissertation, there is the urgency of the overall world economies to switch towards low-carbon environmentally-responsible businesses. Such shifting has started in 2007 with the emission of the "Climate Awareness Bond" by the EIB, the first green bond ever issued, and it keeps growing at a faster pace on a yearly basis in developed countries as well as in emerging economies. This happens especially in countries where in past years there has been a massive use of fossil fuels and then now there is a real need for green investments. In addition, because of at the core of this paper there has been a deep analysis on the main characteristics and development of green

bond markets in developing countries, it emerges that also in less-developed and relatively poorer countries green bonds are rapidly becoming a widespread phenomenon.

For what concerns guidelines, it is clear that there is not homogeneity but rather the panorama is fragmented among countries all over the world: alongside the first guidelines, voluntary and not binding, issued by ICMA, also the CBI put beside in the regulatory framework. A more clear example is China: because its several guidelines strongly differ with the international ones, in China some bonds are labelled as green even if outside national borders they are not considered green. It is expected for the future to unify the market under official and universally accepted guidelines in order to avoid particular disorganization, controversies, and confusion.

But despite the normative divergences, green bonds keep growing as it is estimated by CBI, in its website, that by the end of 2020 the overall volume of issuances will reach USD 350 billion, recording an increase of USD 100 billion from the 2019. From a wider perspective, more and more companies and banks are taking action against climate changes increasing their commitment to invest in climate finance and pursuing ESG targets in order to reduce the direct and indirect impacts of their business activity.



## References

Amundi Asset Management and International Finance Corporation. (2020). *Emerging Market Green Bonds Report*. Amundi Asset Management and International Finance Corporation. <https://www.ifc.org/wps/wcm/connect/a64560ef-b074-4a53-8173-f678ccb4f9cd/202005-EM-Green-Bonds-Report-2019.pdf?MOD=AJPERES&CVID=n7Gtahg>

Bathia, M. Step to Issue A Green Bond. *Sustainalytics*, <https://www.sustainalytics.com/sustainable-finance/2019/02/07/steps-to-issue-a-green-bond/>

Bonds & Loans (2019, June 25). CASE STUDY: Russian Railways' EUR500-mn Issue is Russia's First Green Eurobond. *Bonds & Loans*. <https://bondsloans.com/news/case-study-russian-railways-eur500mn-issue-is-russias-first-green-eurobond>

Bonds & Loans (2020, March 13). CASE STUDY: Russian Railways Rides through Volatility with record-breaking CHF250 Green Bond. *Bonds & Loans*. <https://bondsloans.com/news/case-study-russian-railways-ride-through-volatility-with-record-breaking-chf250mn-green-bond>

Cawthorne, A. (2019, August 15). Kenya approves issuances of first green bond. *Reuters*. <https://www.reuters.com/article/kenya-bonds-green/kenya-approves-issuance-of-first-green-bond-idUSL8N25B1TQ> . (formato per articoli presi da web)

Climate Bond Initiative (CBI). (2018). *The Green Bond Market in Europe*. Climate Bond Initiative (CBI). <https://www.climatebonds.net/files/files/The%20Green%20Bond%20Market%20in%20Europe.pdf>

Climate Bond Initiative (CBI). (2019). *Australia - green finance state of the market 2019*. Climate Bond Initiative (CBI). [https://www.climatebonds.net/system/tdf/reports/australia\\_gbsotm-2019-update\\_201908.pdf?file=1&type=node&id=39346&force=0](https://www.climatebonds.net/system/tdf/reports/australia_gbsotm-2019-update_201908.pdf?file=1&type=node&id=39346&force=0) .

Climate Bond Initiative (CBI). (2019). *Canada green finance state of the market – 2018*. Climate Bond Initiative (CBI). [https://www.climatebonds.net/files/files/CBI\\_Canada%20SOTM%202018\\_web.pdf](https://www.climatebonds.net/files/files/CBI_Canada%20SOTM%202018_web.pdf)

Climate Bond Initiative (CBI). (2019). *Green Bond Pricing in the primary market: January – June 2019*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/system/tdf/reports/cbi\\_gb\\_pricing\\_h1\\_2019\\_final.pdf?file=1&type=node&id=39852&force=0](https://www.climatebonds.net/system/tdf/reports/cbi_gb_pricing_h1_2019_final.pdf?file=1&type=node&id=39852&force=0)

Climate Bond Initiative (CBI). (2020). *2019 Green Bond Market Summary*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/system/tdf/reports/2019\\_annual\\_highlights\\_final.pdf?file=1&type=node&id=46731&force=0](https://www.climatebonds.net/system/tdf/reports/2019_annual_highlights_final.pdf?file=1&type=node&id=46731&force=0)

Climate Bond Initiative (CBI). (2020). *ASEAN Green Finance State of the Market 2019*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/system/tdf/reports/cbi\\_asean\\_sotm\\_2019\\_final.pdf?file=1&type=node&id=47010&force=0](https://www.climatebonds.net/system/tdf/reports/cbi_asean_sotm_2019_final.pdf?file=1&type=node&id=47010&force=0)

Climate Bond Initiative (CBI). (2020). *China Green Bond Market 2019 Research Report*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/system/tdf/reports/2019\\_cbi\\_china\\_report\\_en.pdf?file=1&type=node&id=47441&force=0](https://www.climatebonds.net/system/tdf/reports/2019_cbi_china_report_en.pdf?file=1&type=node&id=47441&force=0)

Climate Bond Initiative (CBI). (2020). *Japan – Green Finance state of the market 2019*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/system/tdf/reports/cbi\\_japan\\_gfsotm2019.pdf?file=1&type=node&id=47161&force=0](https://www.climatebonds.net/system/tdf/reports/cbi_japan_gfsotm2019.pdf?file=1&type=node&id=47161&force=0)

Climate Bond Initiative (CBI). (2020). *Latin America & Caribbean: Green finance state of the market 2019*. Climate Bond Initiative (CBI).

[https://www.climatebonds.net/files/files/CBI\\_LAC\\_SotM\\_19\\_web\\_02.pdf](https://www.climatebonds.net/files/files/CBI_LAC_SotM_19_web_02.pdf)

Denisov J. (2019, December). Green finance comes to Russia. *World exchanges*. <https://focus.world-exchanges.org/articles/green-finance-comes-russia>

Ehlers T., Packer F. (2017). *Green bond finance and verification*, pp 89 – 104. Bank for International settlements (BIS). [https://www.bis.org/publ/qtrpdf/r\\_qt1709h.pdf](https://www.bis.org/publ/qtrpdf/r_qt1709h.pdf)

EURONEXT. (2019). *Supporting Sustainable Growth EURONEXT GREEN Bonds*. EURONEXT. [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj86HujtqAhXIPsAKHWUMCikQFjAEegQIAxAB&url=https%3A%2F%2Fwww.euronext.com%2Fen%2Fmedia%2F2548%2Fdownload&usg=AOvVaw2mZnDCXAvPp6olG5Dn\\_YDX](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj86HujtqAhXIPsAKHWUMCikQFjAEegQIAxAB&url=https%3A%2F%2Fwww.euronext.com%2Fen%2Fmedia%2F2548%2Fdownload&usg=AOvVaw2mZnDCXAvPp6olG5Dn_YDX)

EURONEXT. *EURONEXT GREEN Bonds Process*. EURONEXT.

European Commission. (2016). *Study on the potential of the green bond finance for resource-efficient investments*. European Commission. <https://ec.europa.eu/environment/enveco/pdf/potential-green-bond.pdf>

Fisher M., Hicks E. (2019, January 28). Green by Name, Green by Nature: the First Russian Green Bond. *BMB Russia*. <https://bearmarketbrief.com/2019/01/28/green-by-name-green-by-nature-the-first-russian-green-bonds/>

Global Railway Review (2019, May 20). Russian Railways issues first international Green Bond. *Global Railway Review*. [https://www.globalrailwayreview.com/news/82287/russian-railways-green-bond/https://raexpert.eu/files/RSB\\_HMAO\\_SO\\_Report\\_19.12.2018.pdf](https://www.globalrailwayreview.com/news/82287/russian-railways-green-bond/https://raexpert.eu/files/RSB_HMAO_SO_Report_19.12.2018.pdf)

Henderson I., Mancini M. (2019). Sustainable Finance Progress Report. *UN Environment*. [http://unepinquiry.org/wp-content/uploads/2019/03/Sustainable\\_Finance\\_Progress\\_Report\\_2018.pdf](http://unepinquiry.org/wp-content/uploads/2019/03/Sustainable_Finance_Progress_Report_2018.pdf)

International Bank for Reconstruction and Development. (2015). *What are Green Bonds?*. International Bank for Reconstruction and Development. <http://documents1.worldbank.org/curated/en/400251468187810398/pdf/99662-REVISED-WB-Green-Bond-Box393208B-PUBLIC.pdf>

International Capital Market Association (ICMA). (2008). *Green Bond Principles*. International Capital Market Association (ICMA). <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bonds-Principles-June-2018-270520.pdf>

International Capital Market Association (ICMA). (2016). *Green Bond Brochure*. International Capital Market Association (ICMA) <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjz4uKV1NbqAhWixMQBHSA7ClwQFjAAegQIARAB&url=https%3A%2F%2Fwww.icmagroup.org%2Fassets%2Fdocuments%2FRegulatory%2FGreen-Bonds%2FGreen-Bonds-brochure-150616.pdf&usg=AOvVaw3mGoDhrFKR3ZmxaDtoOCc->

Investopedia. (n.d.). Eurobond. In *Investopedia*. Retrieved July 23, 2020, from <https://www.investopedia.com/terms/e/eurobond.asp>

Investopedia. (n.d.). Greenwashing. In *Investopedia*. Retrieved July 23, 2020, from <https://www.investopedia.com/terms/g/greenwashing.asp>

JSC Russian Railways. (2019). *Green Bond Framework*. JSC Russian Railways. <https://www.climatebonds.net/files/files/Russian%20Railways%20Green%20Bond%20Framework.pdf>

JSC Russian Railways. (2020). *Green Bond Report*. JSC Russian Railways. [https://www.climatebonds.net/files/files/Russian%20Railways%20Green%20Bond%20Report\\_May%202020.pdf](https://www.climatebonds.net/files/files/Russian%20Railways%20Green%20Bond%20Report_May%202020.pdf)

Kidney, S. (2014, February 6). 2013 Overview: the Dawn of an Age of Green Bonds? *Climate Bond Initiative*. <https://www.climatebonds.net/2014/05/2013-overview-dawn-age-green-bonds>

Latham & Watkins. (2020). *The future of sustainable finance in Russia and the CIS*. Client Alert Commentary. <https://www.lw.com/thoughtLeadership/the-future-of-sustainable-finance-in-russia-and-the-cis>

London Stock Exchange Group (LSEG) .(2016). *Green Bonds on London Stock Exchange*. London Stock Exchange (LSEG).

London Stock Exchange Group (LSEG). *Developing the green bond market in Africa*. London Stock Exchange group (LSEG). [https://www.lseg.com/sites/default/files/content/documents/Africa\\_GreenFinancing\\_MWv10\\_0.pdf](https://www.lseg.com/sites/default/files/content/documents/Africa_GreenFinancing_MWv10_0.pdf)

Luxembourg Stock Exchange (LuxSE). *Listing green bonds on LuxSE*. Luxembourg Stock Exchange (LuxSE).

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewiexejIkdzqAhVBhlwKHZchBM0QFjABegQIAxAB&url=https%3A%2F%2Fwww.bourse.lu%2Fdocuments%2Fbrochure-LGX-GB\\_emerging\\_markets-mundi.pdf&usg=AOvVaw35PITOfC\\_Df3orwzlsWTKJ](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewiexejIkdzqAhVBhlwKHZchBM0QFjABegQIAxAB&url=https%3A%2F%2Fwww.bourse.lu%2Fdocuments%2Fbrochure-LGX-GB_emerging_markets-mundi.pdf&usg=AOvVaw35PITOfC_Df3orwzlsWTKJ)

Miriri D. (2019, August 15). Kenya approves issuance of first green bond. *Reuters*. <https://www.reuters.com/article/kenya-bonds-green/kenya-approves-issuance-of-first-green-bond-idUSL8N25B1TQ>

Moscow Stock Exchange (MOEX) (2019, November 12). Moscow Exchange's Sustainability Sector goes live. *Moscow Stock Exchange (MOEX)*. <https://www.moex.com/n25802/?nt=207>

Nomhle Ngwenya & Mulala Danny Simatele. (2020). *Unbundling of the green bond market in the economic hubs of Africa: Case study of Kenya, Nigeria and South Africa*. Development Southern Africa.

[https://www.researchgate.net/publication/339587872\\_Unbundling\\_of\\_the\\_green\\_bond\\_market\\_in\\_the\\_economic\\_hubs\\_of\\_Africa\\_Case\\_study\\_of\\_Kenya\\_Nigeria\\_and\\_South\\_Africa](https://www.researchgate.net/publication/339587872_Unbundling_of_the_green_bond_market_in_the_economic_hubs_of_Africa_Case_study_of_Kenya_Nigeria_and_South_Africa)

OECD. (2017). *Mobilising Bond Markets for a Low-Carbon Transition*, Green Finance and Investment, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264272323-en> .

Pension Fund Service. (2017). *Green Bonds*. Pension Fund Service. <http://pubdocs.worldbank.org/en/554231525378003380/publicationpensionfundservicegreenbonds201712-rev.pdf>

Railway Pro (2020, June 19). RZD to continue its environmental conservation plans. *Railway Pro*. <https://www.railwaypro.com/wp/rzd-to-continue-its-environmental-conservation-plans/>

Rating-Agentur Expert RA GmbH (Frankfurt am Main, Germany). (2018). *“RSB HMAO,, ltd. Green Bond Second Opinion*. Rating-Agentur Expert RA GmbH (Frankfurt am Main, Germany). [https://raexpert.eu/files/RSB\\_HMAO\\_SO\\_Report\\_19.12.2018.pdf](https://raexpert.eu/files/RSB_HMAO_SO_Report_19.12.2018.pdf)

RELX SDG Resource Centre. United Nations Global Compact. *RELX SDG Resource Centre*. <https://sdgresources.relx.com/united-nations-global-compact>

Russia Business Today (2019, January 18). First Green Bond in Russia Issued by Siberian Waste Management Company. *Russia Business Today*. <https://russiabusinesstoday.com/economy/first-green-bonds-in-russia-issued-by-siberian-waste-management-company/>

Sustainalytics. (2019). *JSC Russian Railways. Post-issuance verification letter*. Sustainalytics. [https://www.climatebonds.net/files/files/Russian%20Railways\\_CBI%20Post%20Issuance%20Letter.pdf](https://www.climatebonds.net/files/files/Russian%20Railways_CBI%20Post%20Issuance%20Letter.pdf)

Sustainalytics. (2019). *JSC Russian Railways. Pre-issuance verification letter*. Sustainalytics. <https://www.climatebonds.net/files/files/Russia%20Railways%20CBI%20Pre-Issuance%20Verification%20Letter.pdf>

Töre Ö. (2018, October 15). Russian Railways is the most energy-efficient and eco-friendly railway company in the world. *Ftn news*. <https://ftnnews.com/rail/35190-russian-railways-is-the-most-energy-efficient-and-eco-friendly-railway-company-in-the-world>

UN Environment. (n.d.). United Nation Environment Programme definition. In *UN Environment site*. Retrieved September 19, 2020, from <https://www.unenvironment.org/about-un-environment>

Unicredit Research. (2017). *Credit research – Credit view*. Unicredit Research [https://www.research.unicredit.eu/DocsKey/credit\\_docs\\_2017\\_160600.ashx?EXT=pdf&KEY=n03ZZLYZf5nU-0Se\\_JN77mL1QXv1AoUfFIR6cAUak9s=&T=1](https://www.research.unicredit.eu/DocsKey/credit_docs_2017_160600.ashx?EXT=pdf&KEY=n03ZZLYZf5nU-0Se_JN77mL1QXv1AoUfFIR6cAUak9s=&T=1)

Wikipedia. (n.d.). Green Star (Australia). In *Wikipedia*. Retrieved July 12, 2020, from [https://en.wikipedia.org/wiki/Green\\_Star\\_\(Australia\)](https://en.wikipedia.org/wiki/Green_Star_(Australia))

Wikipedia. (n.d.). NABERS. In *Wikipedia*. Retrieved July 12, 2020, from <https://en.wikipedia.org/wiki/NABERS>