EXECUTIVE SUMMARY

Green Bonds: what contribution to the Paris Agreement and how to maximize it?

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Adopted in 2015 at COP21, the Paris Agreement triggered new momentum in the fight against climate change and confirmed the global target of limiting the rise of global mean temperature to 1.5-2°C compared to the preindustrial period. Among the objectives, the central role finance has to play in order to achieve this transition has been reaffirmed in Article 2.1.(c): "Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development". If public finance flows have to be redirected to low-carbon and climate resilient development, the scale of financing needs also requires a shift in the reallocation of private finance flows from carbon-intensive activities to investments compatible with a 1.5-2°C pathway.

This has contributed to a major emphasis being put on "climate" or "green" finance since the signature of the Paris Agreement – expanding the discussion beyond the issue of transfers of public funds between developed and developing countries that has dominated the climate agenda since the COP in Copenhagen in 2009. For financial actors to redirect their assets from carbon-intensive to low carbon ones, they need to understand and be able to track which assets are compatible with a 1.5-2°C pathway.

Green bonds are fixed-income securities whose proceeds are used exclusively to finance or re-finance environmentally sound projects. They are increasingly seen as one of the key 'green' financial products aimed at financing assets compatible with a low-carbon and climate resilient economy, referred in this note as 'low-carbon climate resilient (LCCR) investments'. On the one hand, market actors are enthusiastic about the rapid growth of this new market – as well as the spotlight it drives on sustainable finance. However, on the other hand, some observers are concerned about two key challenges for the green bond market. First, the green bond market does not appear to directly stimulate a net increase in green investments, e.g. through a lower cost of capital. Second, the spontaneous bottom-up manner of the development of the green bond market raises reputational and legal risks related to its environmental integrity. In order to realize its full potential to contribute to the LCCR transition, the green bond market will therefore have to overcome these two challenges. These two challenges echo the two key topics currently in discussion at the EU level as part of the High Level Group on Sustainable Finance – providing more information transparency and improving the contribution of the financial sector to sustainable development (European Commission 2017).

To further analyze these two key challenges of the Green Bond market, I4CE with support from the Climate Works Foundation launched a research program from which the key results of the two reports are presented in this note:

- **Report 1. Green Bonds: Improving their contribution to the low-carbon and climate resilient transition;**
- **Report 2. Environmental integrity of green bonds: stakes, status and next steps.**

The overarching methodology of the study was based on desk research and bilateral interviews with various public and private actors involved in the green bond market. To facilitate the discussion and exchange of ideas among relevant stakeholders, I4CE together with the World Wildlife Fund (WWF) and the European Investment Bank (EIB) also organized two practitioner workshops on 7 March 2017 in London and on 15 June 2017 in Paris. This input was folded into the final reports that will be available soon.

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Report 1.
Green Bonds: Improving their contribution to the low-carbon and climate resilient transition

This section presents key findings of the Work Package 1 on the challenges and opportunities to ensure financial additionality of the green bond market. The report first explores what categories of low-carbon, climate-resilient (LCCR) investment needs could theoretically be financed by bonds and where main financing gaps are lying. Second, the report analyses if the labelled green bond market could contribute in directing additional bond financing to LCCR investments in the future. Third, the report suggests and briefly analyzes some market-led and public-led measures that could help boost the contribution of the green bond market to the financing of the low-carbon transition.

Overall, this report transparently assumes that the overall objective of developing the green bond market is to support the LCCR transition, and thus to bring additional benefits to LCCR assets compared to non-labelled climate-aligned bonds. Rather than only analyzing what measures could help accelerate the development of the green bond market, this study aims at assessing how the development of the labelled green bond market could contribute in "shifting the trillions" and aligning financial flows with the objectives of the Paris Agreement as per its Article 2.1.c. It finally draws conclusions that could be applicable for other 'green' instruments and provides a brief overview of how public policy might push for a better 'mainstreaming' of climate issues into financial decision-making.

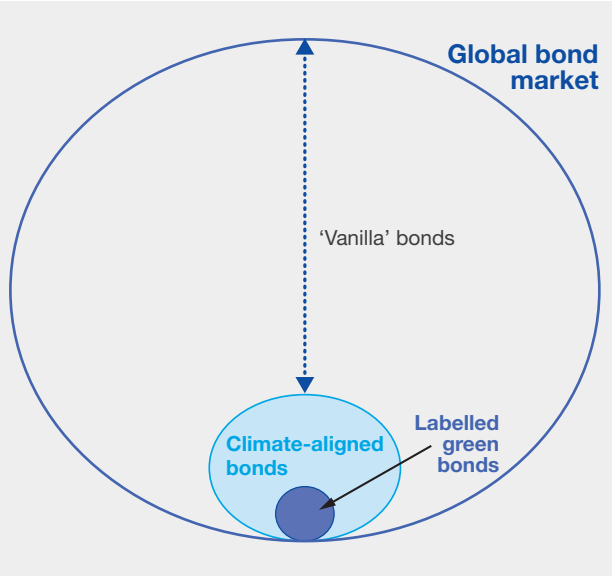
To achieve the Paris Agreement's objective of limiting the rise of global mean temperature to +2°C compared to the preindustrial period, a shift in the allocation of private finance flows from carbon-intensive activities to investments compatible with a 2°C pathway will be necessary. Among all sources of private capital, institutional investors are seen as key as they do not currently face the same deleveraging constraints as corporate actors and banks. Among financial instruments, bonds are particularly well suited to access financing from institutional investors. Given the often high expectations around bonds, it is thus important to understand the role that this financial instrument can play in financing LCCR investments, and how the green bond market can help bonds contribute to directing additional flows towards LCCR assets.

BOX 1. BREAKING THE GLOBAL BOND UNIVERSE INTO VANILLA, CLIMATE-ALIGNED AND LABELLED GREEN BONDS

This note differentiates between a) traditional bonds, b) bonds labeled as "green" at issuance, and c) bonds financing LCCR assets, but not necessarily labelled as being "green". While they are not adopted by all market stakeholders, they nevertheless introduce clarity to discussions :

- **'Vanilla' bonds** refers in this report to all bonds with no specific 'green' component, i.e. the entire bond market exclusive of climate-aligned bonds and labelled green bonds.
- The term **"climate-aligned bonds"** are indifferently used in this report to refer to bonds financing or refinancing LCCR investments, no matter if they are advertised at issuance as being "green" or not. As such the market of climate-aligned bonds is much larger than the market of labelled green bonds (CBI 2017).
- The term **"labelled green bonds"** refers to a subset of climate-aligned bonds that were labeled as "green" at issuance. It includes both green bonds benefiting from a label such as the Green Bond Standard and green bonds without a label or standard, but that received an external review of its green credentials. Please refer to Report 2 "Environmental integrity of green bonds: stakes, status and next steps" (Igor Shishlov, Morgane Nicol, and Ian Cochran 2017) for more information on the different processes for issuing a bond as "green".

FIGURE 1 : BREAKING THE GLOBAL BOND MARKET INTO VANILLA, CLIMATE-ALIGNED AND LABELLED GREEN BONDS



Source: authors

A large part of the potential for bonds to increase their share in financing LCCR assets could come from asset-backed securities

Estimates of the volume of global low-carbon investments are up to USD 3.2 trillion per year. Consequently, even if uncertainties on this figure remain large, there is no doubt that a significant shift in financial flows from carbon-intensive to low-carbon sectors will be needed to close the LCCR investment gap. The main increase in LCCR investment will have to be targeted towards energy efficiency actions, and notably low emissions vehicles and energy efficiency in buildings, which are mainly fulfilled by individuals and SMEs. On the other hand, the bond market is primarily an instrument suited for use by large (> USD 100 million), low-risk issuers or assets benefiting from good credit ratings, or homogeneous and standardized pools of small-scale assets as for asset-backed securities. As a result, even if in theory scenarios can be imagined where almost all categories of LCCR investment needs could be financed through the bond market, in practice the use of bonds to finance all types of actions may not be feasible.

In particular, investments carried out by individuals and most investments carried out by SMEs – which represent a large part of the LCCR investment gap – are not able to directly access the bond market. From these categories only assets primarily financed through bank loans could indirectly reach the bond market, thanks to a refinancing through either financial bonds or asset-backed securities. As a result, a significant portion of the potential for bonds to increase their share in financing LCCR assets would come from asset-backed securities. Asset-backed securities are estimated to represent as much as 44% of outstanding bonds in 2035 according to OECD (OECD 2017); however this segment represented only 6% of the market in 2016 suggesting that significant efforts are needed if this is to occur.

TABLE 1. POTENTIAL OF DIFFERENT GREEN BONDS INSTRUMENTS FOR DIFFERENT INVESTMENT NEEDS

Different bond instruments…		… for different investment needs	*Range of estimates of annual investment needs*
Corporate and SSA (Sovereign, Supranational, and Agency) bonds	Corporate bonds are bonds backed by a corporate's balance sheet (mainly large corporates).SSA bonds comprise treasury bonds and bonds issued by development agencies and local authorities.	• Renewable power generation	• USD 250 to 570 Bn
		• Electricity transport and distribution	• USD 270 to 420 Bn
		• Clean transport infrastructure	• No specific estimates available
		• Energy efficiency investments in industry and transport by large corporates	• A portion of USD 100 to 580 Bn- further research needed
Project bonds	Project bonds are project-based bonds issued by Special Purpose Vehicles (SPVs), with no or limited recourse to project holder	Same as corporate and SSA bonds, but only the largest projects (> USD 100 Bn, indicative figure)	Further research needed
Asset-backed securities	Financial bonds issued by a SPV and backed by a pool of loans, leases or receivables, all illiquid assets that become marketable through a process called securitization.	• Electric vehicles (and other alternative energy vehicles)	• USD 330 to 430 Bn
		• Energy efficiency in buildings	• USD 180 to 740 Bn
Financial bonds	Bonds issued by financial institutions to finance 'on-balance sheet lending' with recourse to the issuing financial institution.	All categories of investment needs when initially funded by banking institutions	All investment needs
No clear potential for green bonds		• Agriculture, Forestry and Land-use • Adaptation	Further research needed on characteristics of needed investments and estimates of the volume of these needed investments

Source: Authors

The lack of pipelines of "bankable" LCCR assets is the main obstacle to expanding issuance of LCCR bonds

The green bond market could help overcome some specific obstacles that are limiting LCCR assets from accessing bond financing. However, there do not seem to exist significant obstacles preventing specifically LCCR assets to access the bond market. It is rather a lack of a pipeline of projects that is limiting the use of bond financing.

As in the case of the use of other financial instruments, the principal obstacles to expanding the issuance of bonds supporting LCCR assets stem from how financial actors perceive the risks related to these assets, as well as more generally the short-term horizon of financial analysis. Moreover, and maybe more importantly, there appears to be a systematic lack of pipeline of LCCR investment projects and opportunities across sectors and geographies.

Therefore, to grow financial flows directed towards LCCR assets, a first step should be putting in place the economic policy frameworks necessary to increase the pipeline of projects that both look, and are eligible, to access finance. The green bond market itself could be used to expand these pipelines of "bankable" LCCR assets if it is able to improve the financial conditions compared to other forms of bond finance.

In the current regulatory and institutional context, labelling bonds that support climate-aligned activities as 'green' has little potential to provide additional financial flows to LCCR investments

To contribute in financing additional LCCR investments, the green bond market should improve financial conditions for LCCR assets and modify the risk perception of LCCR bonds.

However, in the current regulatory and institutional context, labeling these bonds as green would have limited impact on increasing the volume of finance directed towards LCCR investments beyond what would have occurred without labelling. Indeed, labelling a bond as 'green' does not currently – and might not in the future – carry a non-negligible price premium in the primary market. Neither does it currently improve the credit quality of the bond for investors. As a result, green bonds are not bringing additional funding toward LCCR assets, they represent a 'green labeling' of investments that would have occurred in any case.

The labelled green bond market does nevertheless bring valuable non-financial benefits contributing to the transition to a low-carbon and climate-resilient economy: it eases the process of tracking 'green' investment opportunities for investors, and it can contribute to accelerating the elaboration of a climate strategy in the issuing entity, or 'anchoring' this strategy in the organization and its processes.

As a result, public institutions and civil society should not expect the green bond market to contribute significantly to directly increasing the volume of financial flows for LCCR investments. Attention should rather be focused on the value that could be generated by using this instrument as a way to 'measure' and track the ambition and 'depth' of climate actions developed by issuing entities and investors. Given this important informational benefit, public authorities could contribute to increase the volume of LCCR assets financed or refinanced by bonds by fostering the development of a market for LCCR asset-backed securities, and by pushing for a 'mainstreaming' of climate issues into financial institutions.

Public policies directed at the green bond market should focus on increasing the share of climate-aligned bonds labeled as 'green' …

To foster the labelling of climate-aligned bonds, suggested measures could first aim at decreasing the additional transaction costs of 'green' labelling. This could be achieved through direct subsidies in countries and monetary zones without an active green bond market. In all countries and regions, policymakers could require the same level of transparency and disclosure as requested for a green bond issuance to all issuances. Second, measures could aim at fostering an increased demand for green bonds, through policies such as a mandatory disclosure of climate strategies by investors - or even minimum quotas for green bonds for specific regulated financial products. This could result in companies being incentivized to increase issuance of labelled green bonds, notably through an engagement strategy put in place by financial institutions. Finally, both the supply and demand for green bonds should be supported in parallel to maintain a good supply-demand equilibrium in the labeled green bond market, and ensure a smooth development.

…and when appropriate developing a market for 'green' asset-backed securities

Several public policy measures could be designed to foster the development of a securitization market for LCCR assets. Some of them could target potential ABS issuers and aim at developing the pipeline of LCCR loans available for securitization, such as creating a warehousing entity for LCCR small-scale loans or introducing a requirement for banks to disclose the 'green' share of their loan books. Some could target potential investors, to incentivize investing in climate-aligned ABS and overcome the obstacle of a lack of historic data related to LCCR loans, notably through credit enhancement schemes. Such schemes should be backed by strong eligibility criteria, notably on the environmental integrity, and require high quality and transparency in the securitization process, given the current reputation and history around securitization.

More broadly, public policies could be designed to incentivize investors to favor 'green' over 'brown' financial assets

Finally, the green bond market would also be reinforced by broader public policies incentivizing investors to favor 'green' over 'brown' financial assets. Notably, different measures for integrating climate issues into prudential and monetary policies are today hotly debated. Further detailed analysis should be undertaken to formulate precise public policy recommendations on this topic. Research - based within specific countries, regions or monetary zones - is needed to fully understand potential impacts and whether it can support the contribution of the bond markets to the low-carbon resilient transition.

TABLE 3. LIST OF POTENTIAL PUBLIC-POLICY MEASURES PRESENTED IN THE REPORT

Potential measures to increasing the share of bonds financing LCCR investments labelled as green		
Suggested measure	**Benefits**	**Limits**
Subsidize the cost of labelling bonds as "green"	• reduce 'green' transaction costs • push a systematic 'green' labelling • support the development of a market for external reviews • contribute to a standardisation of the 'green' labelling	• costly measure for countries with an already active green bond market • the risk of 'free-riding' needs to be limited, notably through the definition of a public standard for 'green'
Introduce mandatory reporting obligation on green assets to all firms or all bonds issued	• decrease the distortion in transaction costs between green bonds and 'vanilla' bonds • push firms structure discussions about their climate change strategy	• labor costs for mandated entities • may add an additional reporting burden that could be limited by an integration into existing reporting frameworks
Introduce mandatory disclosure on the "use of proceeds" of all bonds issued	• decrease the distortion in transaction costs between green bonds and 'vanilla' bonds • enable to tag 'brown' and 'green' assets and evaluate alignment with a decarbonization trajectory	• labor costs for mandated entities • additional reporting burden • could disadvantage bonds over other financial instruments due to increased transaction costs
Push for an increasing demand in green bonds: from mandatory disclosure of the climate strategy of investors to introducing minimum quotas for green bonds to specific investors or investment products	• boost the demand for labelled green bonds, leading to investor engagement for a greater supply of green bonds and finally an increased pipeline of labelled green bonds	• need to be weighed against the risk of creating a 'bubble' of 'green' financial assets
Potential measures to increasing the pipeline of LCCR ABS, labelled as green or not		
Suggested measure	**Benefits**	**Limits**
Warehousing of small-scale LCCR loans	• gather more quickly a large enough pool of standardized 'green' loans for securitization • incentivize banks to tracking LCCR loans in their portfolios • build a track record on LCCR ABS	• fixed costs for the creation and management of the vehicle • need to ensure sufficient interest from partner banks, loan contract standardisation, transparent governance of the process
Provide public credit enhancement for green securitized assets	• strong incentive for banking institutions to securitize their portfolio of LCCR loans • indirectly push banks to tag LCCR loans in the portfolios • improve the risk/return profile of 'green' ABS and develop the necessary track record • ease tracking LCCR small-scale loans	• costly for the mandated public institution • risk profile of LCCR assets is not cited in the top obstacles to LCCR securitization
Introduce a requirement for banks to disclose the 'green' share of their loans' book	• the lack of tagging of LCCR loans by banks may be one top obstacle for increased LCCR securitization • enable to evaluate the alignment of loan portfolios with a decarbonization trajectory, as a first step to evaluating the exposure to transition risks of the banking system	• labor and IT costs for banks • may add an additional reporting burden that could be limited by an integration into existing reporting frameworks

Source: Authors

TABLE 3. LIST OF POTENTIAL PUBLIC-POLICY MEASURES PRESENTED IN THE REPORT *(continued)*

Potential ambitious measures to incentivize investors in favoring green over brown financial assets		
Suggested measure	**Benefits**	**Limits**
Require financial institutions to integrating climate risks into mainstream risk analysis and internal notations	• entail better financing conditions for organizations more committed to the low-carbon transition • push financial actors in favoring 'green' financial assets	• requires major adaptations of risk processes and IT systems of financial institutions • models development needs to be carried out in close collaboration with climate research centers
Revise supervisors' guidelines for risk notation determining prudential requirements	• would result in a decreased Capital Adequacy Ratio for financial actors more invested in LCCR assets • incentive to favor 'green' over 'brown' financial assets	• an important research effort in close collaboration with climate research centers is needed to develop the necessary scenarios and models
Introduce a 'green' macroprudential policy	• would incentivize financial actors to favor assets less exposed to climate transition risks • strong incentive for banks to tag and track 'green' assets in their balance sheets • could help reduce the exposure of the financial system to climate transition risks	• may lead to an underpricing of risks relative to real risks carried by 'green' assets, and ultimately entail a 'green' bubble • detailed criteria for determining the exposure to climate transition risks should be carefully designed • should not lead to a global decrease in the Capital Adequacy Ratio of the banking system
Include green assets into central bank's collateral framework	A detailed analysis would be needed	
Implement a 'Green' Quantitative Easing	A detailed analysis would be needed	

Source: Authors

Report 2.
Environmental integrity of green bonds: stakes, status and next steps

This section presents key findings of the Work Package 2 on the challenges and opportunities to ensure environmental integrity of green bonds. First, the report identifies and categorizes the stakes for market actors to ensure the environmental integrity of green bonds. Second, the existing approaches to defining the eligibility of 'green' assets are reviewed and key challenges and next steps are identified. Third, the existing approaches to external review and reporting are reviewed and key challenges and next steps are identified. The report then concludes with recommendations for policymakers and market actors to improve practice in this area.

Overall, this report makes the transparent assumption that the objective of ensuring 'environmental integrity' of the green bond market is to support the LCCR transition. While there may not be a full market consensus on the active contribution of the green bond market, this appears to increasingly be one of the policy-related objectives expected by a number of public, private and civil-society stakeholders. Furthermore, this is not just the case for the green bond market, but touches upon the need for 'greening' or 'alignment' of all financial assets as per Article 2.1c of the Paris Agreement.

The green bond market is increasingly seen as having important potential to contribute to the systematic labelling of financial assets financing LCCR investments. It is therefore crucial to ensure the environmental integrity of the green bond market. This report explores the understanding of stakes and challenges related to the environmental integrity of green bonds and suggests potential next steps for both private and public stakeholders.

Ensuring the environmental integrity of green bonds is crucial to maximize their contribution to the LCCR transition

Enhanced transparency of information provided by green bonds can unlock a number of benefits for issuers, investors and policymakers supporting the growth of the market. While there is an increasing consensus that this additional transparency brings added value, there are however neither harmonized definitions and taxonomies, nor a common reporting framework for green bonds. This lack of harmonization has already translated into a number of controversies highlighting environmental, reputational and legal risks that the green bond market is currently facing. To ensure its meaningful contribution to the low-carbon transition through improved transparency of information, public and private market actors will need to address these challenges and guarantee the environmental integrity of green bonds and improve climate-related disclosures for other financial products.

Defining the eligibility criteria for 'green' assets: towards convergence of definitions

Currently, there is no single definition of 'green' eligibility and taxonomies; furthermore, an array of actors provide their definitions, which may or may not overlap. The principal divergence on green definitions in the market stems from the national circumstances in China, where improved fossil fuel efficiency is included in the national definitions of green assets. This highlights the fact that there are a number of challenges to the establishment of international commonly accepted green definitions including: different investor expectations; divergent national circumstances; time horizon; scope of assessment; and disconnects between green bond issuance and the overall environmental strategy and 'greenness' of an issuing entity.

At the time of writing, three principal initiatives are working to harmonize "green" definitions: the European Commission's High-Level Expert Group on Sustainable Finance (HLEG) at the EU level; the China-EU dialogue at a bilateral level; and the development of ISO 14097 standard at the international level. While each of these processes is functioning at a different level, what appears certain is that three categories of stakeholders are involved: independent expert NGO(s), formal national / international climate policymakers, and other intergovernmental or multilateral development institution(s). To ensure sufficient adoption of the outputs of the harmonization process in practice, all of these three categories of stakeholders, as well as market actors, should play an active role in the harmonization process. Finally, harmonizing approaches for defining green should be properly assessed and treated with caution to avoid being based on the "least common denominator" of criteria used in current practice.

Furthermore, governments should support these processes by speeding up the elaboration and communication of their long-term low-carbon development strategies as mandated by the Paris Agreement and fostering labeling based on best practices. The Task Force on Climate-Related Financial Disclosure (TCFD) has recommended that governments should also foster broader disclosure of environmental impacts and climate-related risks in the financial sector. This appears particularly important for the green bond market that faces the risk of 'greenwashing' due to the zero-sum nature of green labeling in the absence of entity-wide climate-related disclosures.

The results of harmonization: definitions, taxonomy or beyond?

Beyond looking at the harmonization process, it is important to clarify what is actually being discussed. Currently, market stakeholders calling for harmonization are not all referring to the same thing.

A harmonized framework should at a minimum define a common language for defining 'green'. This means for example more precisely defining what is 'an energy efficiency investment' or a 'clean energy project'. For example, for some actors clean energy may cover the most carbon-efficient gas power stations, whereas for others no fossil-fuel power stations should be considered as clean energy.

As a second step, a harmonized framework could present a detailed taxonomy of 'eligible assets'. Such a taxonomy could present all sub-sectors and technologies that would be eligible for a green bond. Green bonds issuers would then have to 'tick the boxes' of this taxonomy when presenting the expected 'use of proceeds' of their green bond issuance.

A last step could require the harmonization process to also cover quantitative impact-focused indicators that investments or projects would have to achieve in order to be eligible for the 'use of proceeds' of a green bond. Such indicators could notably define the maximum carbon footprint that would be accepted per sub-sector and technology depending on the level of activity. This would allow identification of assets not aligned with the LCCR transition in a defined subsector. For instance, this would identify and potentially exclude in the sub-sector of hydropower, stations that emit large volume of methane – a gas with a high global warming potential, despite producing renewable energy.

The scope and flexibility of the harmonization process should be set with caution and should allow for 'green' definitions to be based on climate science. It should notably ensure that:

- **A harmonized framework would still allow to take into account technological developments.** If the framework does include a taxonomy and quantitative criteria, having it included in a regulatory framework may prevent from regular updates taking into account last technological developments. Moreover some technologies may not be very carbon efficient at the beginning of technological development but could be a solution for the low-carbon transition in the long-run – for instance electric vehicles some years ago.
- **A harmonized framework should allow differentiation between solutions reducing GHG emissions today, and solutions that are fully aligned with a LCCR transition.** One way of reaching this could be to setting a taxonomy defining several level of 'green' and that would allow investors to choose between green bonds depending on their sustainability mandates. Furthermore, governments could facilitate the process by developing and publishing their long-term low-carbon transition trajectories as called to do so by Article 4, paragraph 19 of the Paris Agreement.

Some market actors may argue that a single definition of 'green' is not needed and that top-down regulations may hinder the development of the green bond market. These fears, however, appear to be unsubstantiated from the public policy point of view. Indeed, since the green bond label does not change the underlying investment flows by itself as seen in Report 1, there is no justification for sacrificing the environmental integrity for the sake of the growth of labeled bond market. Conversely, establishing a

commonly accepted taxonomy of green assets (not only green bonds) would help increase the overall transparency of the financial system and help reduce transaction costs in the long-run thanks to standardization and streamlining processes.

External review and information transparency: limited reporting and lack of agreed indicators

Independent external review is the main approach currently used in the green bond market to ensure its environmental integrity. Implementing reporting and assurance procedures for green bonds faces a number of challenges, including: comparability vs. relevance of information; conflicts of interest; choice of impact assessment indicators; voluntary vs. legal reporting obligations; and additional transaction costs. External review and assurance procedures will have to be reinforced and streamlined in order to boost the credibility of the environmental review process for green bonds. In order to ensure the quality of external review and avoid the potential conflict of interest, an accreditation procedure can be implemented in new standards/labels similar to the one practiced by the Climate Bonds Standard or procedures applied in carbon accounting schemes. Moreover, climate-related financial disclosures should be incorporated in general financial reporting as suggested by the Task Force on Climate-Related Financial Disclosure.

Existing green bond frameworks recommend issuers to disclose information on the use of proceeds, which is done for about two-thirds of issuances to date. Conversely, the reporting on environmental impacts of underlying investments remains completely voluntary and is currently done by only a third of issuers, although it is increasingly seen as the best practice. The International Capital Markets Association (ICMA) is piloting the work on impact reporting harmonization, although the existing reporting templates so far cover only three out of ten thematic areas as defined by the Green Bonds Principles (GBP). Currently, there is no harmonized set of impact reporting indicators, which remains a challenge for comparability and relevance of information. Indeed, as it currently stands, the green bond market does not allow investors to assess the alignment of the assets with the LCCR transition. Key sub-sector indicators for impact reporting adapted for climate-related portfolio assessment will therefore need to be developed for green bonds and other financial products.

TABLE 4. DIFFERENT TYPES OF EX-ANTE AND EX-POST REVIEW OF GREEN BONDS

Type	Scope or review services and deliverables *(source: Green Bond Principles)*	Key actors	Existing market standards	EU regulatory frameworks
Consultancy and 'second opinion'	An issuer can seek advice from consultancy firms to establish their green bond framework, or for a 'second-opinion' review of the set green bond framework. Some actors provide both services, while some have chosen to provide only 'second-opinion' reviews to avoid conflicts of interest.	CICERO, Oekom, Sustainalytics, Vigeo	Only very broad guidance for consultancy services available under ISO 20700	Unregulated
Certification	An issuer can have its Green Bond or associated Green Bond framework or Use of Proceeds certified against an external green assessment standard. An assessment standard defines criteria, and alignment with such criteria is tested by qualified third parties / certifiers.	Climate Bonds Initiative	Climate Bonds Standard 2.1 (December 2015)	Unregulated
Verification	An issuer can have its Green Bond, associated Green Bond framework, or underlying assets independently verified by qualified parties, such as auditors. In contrast to certification, verification may focus on alignment with internal standards or claims made by the issuer.	EY, KPMG, PwC	International Standard for Assurance Engagements (ISAE) 3000	Auditing and professional services firms are regulated businesses in most jurisdictions.
Rating	Rating: An issuer can have its Green Bond or associated Green Bond framework rated by qualified third parties, such as specialised research providers or rating agencies. Green Bond ratings are separate from an issuer's ESG rating as they typically apply to individual securities or Green Bond frameworks.	Moody's, Oekom, S&P, Cicero	N/A	Credit rating agencies are regulated in by the European Securities and Markets Authority (ESMA)

Source: authors based on the practitioner's workshop to guide the development of frameworks for external reviews organized by the WWF, the EIB and I4CE on 7 March 2017 in London.

Next steps for the bond market: harmonization and bolstering of external review and reporting practices

There are a number of challenges related to the external review process including the difficulty in selecting reporting indicators, the lack of comparability of information, potential conflicts of interest and transaction costs. In its report the TCFD recommends that 'organizations provide climate-related financial disclosures in their m ainstream [i.e., public] annual financial filings' (TCFD 2017). The logical next step could therefore be the integration of climate-related external review – including but not limited to green bonds – in the

TABLE 5. REQUIREMENTS ON REPORTING OF THE USE-OF-PROCEEDS UNDER EXISTING FRAMEWORKS

	Green Bond Principles	Climate Bonds Standard	Country Guidelines
1. Reporting frequency	Annual	Annual	**PBoC*:** quarterly **SEBI**:** annual **Japan:** annual
2. Availability of reporting	'Readily available'	Mandatory to bondholders and Climate Bonds Standard Secretariat; public reporting encouraged	**PBoC:** disclose 'to the market' quarterly, report to the PBoC annually **SEBI:** public with annual and quarterly financial results **Japan:** public
3. Location of reporting	• Annual report and accounts • Annual sustainability reporting • Separate section of website • Investor letter • Separate green bond report	• Annual report and accounts • Annual sustainability reporting • Separate section of website • Investor letter • Separate green bond report	**PBoC:** not specified **SEBI:** 'along with annual report and financial results'
4. Period of reporting	Until allocation is complete	For the life of the bond	**PBoC:** duration of the bond **SEBI:** not stated **Japan:** until full allocation
5. Use of proceeds information to include	Mandatory: broad categories and % allocated to each Recommended: • List of projects and assets if not commercially sensitive • Description of projects • Expected impact of projects	• Nominated assets and projects detailed in full 'in line with confidentiality agreements' • Percentage of refinancing • Description of projects • Expected impact of projects	**PBoC:** Proceeds allocation; assessment to green projects (recommended); associated environmental benefits (recommended) **SEBI and Japan:** broad categories and % allocated **Recommended:** list of projects and assets if not commercially sensitive; description of the projects; expected impact of projects
6. Allocation information	• Amount allocated to projects • Percentage of bond to refinancing	• % of bond allocated to date • Percentage of bond to refinancing • Details of unutilized proceeds	**PBoC:** amounts allocated **SEBI:** details of unallocated proceeds **Japan:** details of unallocated proceeds
7. External verification	Recommended	Recommended	**PBoC:** recommended **SEBI:** mandatory

**People Bank of China*
*** Securities Exchange Board of India*

Source: CBI (2017c)

broader financial accountability. International assurance standards (ISAE 3000) could offer possibilities to expand the scope of the verification to include standardized non-financial metrics and data, while engaging the 'big 4' professional services could enable tapping into their expertise in auditing and assurance.

In order to ensure that reviewer organizations possess necessary skills and processes to undertake quality reviews an accreditation procedure could be put in place. Accreditation would make reviewers accountable, as it is done in other sustainability standards (e.g. FSC, MSC, ASC), technical certification schemes (e.g. ISO) or in most carbon pricing mechanisms (e.g. the EU ETS, the CDM, etc.). Moreover, reviewer accreditation could include the requirements to put in place a "firewall" separating consulting and auditing services in order to prevent the potential conflict of interest in external review, as it is done for financial audit firms. Indeed, past research on carbon accounting schemes demonstrated that the risk of losing accreditation appears to be a strong deterrent for auditors to manipulate environmental data (Bellassen et al. 2015).

For firms to request accreditation, a standardization of the definition of green, of required processes for issuing a green bond and of evaluation methodologies could be necessary. In the absence of such standards, potential external reviewers/verifiers could be deterred from providing this service as it represents a reputational risk for them.

While the majority of green bond issuers provide reporting on the use of proceeds, environmental impact reporting remains anecdotal, which may put the environmental benefits of green bonds into question (CBI 2017). There appears to be the need to balance short term impact evaluation (e.g. GHG emissions) and long-term transformative and strategic changes (alignment with a 2°C scenario). The TFCD report provides certain sectoral starting points that may help clarify the needs of impact reporting. Additional human resource investment will be needed to support robust impact assessment.

Overall, existing and future green bond frameworks – be they market-driven or regulatory – will need to take into account challenges outlined in this report in order to ensure the environmental integrity of the green bond market.

TABLE 6. STEPS TO IMPROVE THE GREEN BONDS REVIEW AND REPORTING PROCESS

Type	Advantages / functions	Market challenges / limitations	Ways how challenges could be addressed
Consultant review (ex-ante and sometimes ex-post)	Improvement on issuer disclosure. Ensuring the information investors are looking for is disclosed. Can be tailor-made and reflect the information most relevant to a given issuer.	(Perceived) transaction costs potentially limiting scaling up of the market. Reviews may lack independence. Reviews often provide limited disclosure of environmental performance criteria.	Increased consistency and detail in disclosure for second party reviews. Creating codes of conduct to separate consulting and review services to minimize the risk of the conflict of interest.
Certification (ex-ante)	Reducing transaction costs through standardization. Verifiers undergo an accreditation procedure. Independence from issuer increased compared to second party review model if certification is carried out by an independent body. Eligibility criteria set in advance.	It is time-consuming and resource intensive to develop robust sector-specific criteria that would be applied in a given certification scheme. Issuers may be under the perception that undertaking third party assurance is costlier, in effort and money than a second party review, but this depends on cases. Ambitious certification standards might be difficult to spread due to the relative complexity of the process.	Governments could create new or support existing best-practice labels by offsetting the cost of certification in sectors that are deemed priority and/or aligned with a national decarbonization strategy.
Verification (ex-post)	Transaction costs can be lower, as the assurance can be integrated with general financial audits for the issuer. More independence than the second party review through adherence to international assurance standards.	In most cases, verification/assurance does not cover the environmental impacts of the projects funded by the bond. Post-issuance verification might result in a requalification of the green bonds and the risk for investors to see their investments classified as not green. Post issuance verification can give rise to confidential price sensitive information that must be managed with due consideration (market sensitivity, legal and regulatory implications).	International assurance standards (ISAE 3000) could offer possibilities to expand the scope of the verification to include standardized non-financial metrics and data. Engaging the 'big 4' professional services tapping into their expertise in auditing and assurance. Engaging local auditing firms, while requiring them to apply a standardized approach to enable scale and improved access to international investors.
Ratings (ex-ante and ex-post)	The green bond reviews could benefit from rating agencies' credibility in the mainstream financial markets.	Certain rating agencies, such Moody's, are currently exploring green bond assessments that are focused on rating the process (management of proceeds, disclosure and reporting). Others, such as S&P Global, Vigeo, Sustainalytics or Oekom are providing detailed rating on how green the projects funded by the green bonds are. In some instances, this is combined with providing an overall ESG rating of the issuer (rather than the issuance). Investors may want more information on green asset quality, which some rating agencies do not directly have the expertise to assess.	Adapt methodologies to ensure that a green bond cannot get a high green bond rating based on good management of proceeds and reporting processes alone if the bond is not funding sound green projects.
Reporting on the use of proceeds (ex-post)	Reporting on the use-of-proceeds serves to ensure that the money raised through the issuance of green bonds is actually spent on green projects.	Three quarters of green bonds provide reporting on the use-of-proceeds, however, the level of detail may range from only broad categories to the level of projects. Existing frameworks do not mandate the use of concrete KPIs for different sectors.	Reporting on the use-of-proceeds should become mandatory as it is the essence of green bonds. The level of detail and concrete type of information to be reported has to be specified in future and existing frameworks.
Impact reporting (ex-post)	Impact reporting serves to provide investors and observers with information on environmental outcomes of investments underlying green bonds.	About a third of green bond issuers provide information on environmental impacts and only a quarter provide detailed information. The choice of impact indicators is not regulated and remains a challenge for comparability and relevance of information.	Ratchet up the work of the ICMA on harmonized impact reporting for all sectors and develop sub-sectoral KPIs. Explore the possibility of adapting existing GHG calculation methodologies (e.g. the CDM) for the green bond market.

Source: authors

Towards broader climate disclosures in the financial sector

Overall, disclosure and reporting guidelines for green bonds should be coherent with guidelines for reporting on other financial instruments, and above all reporting on the climate impact of a financial portfolio for financial institutions. These approaches currently differ, as green bond impact reporting as mostly carried out today does not allow financial actors to directly feed into their reporting on the "greenness" of their portfolio or its alignment with the LCCR transition. Notably, financial actors mainly use carbon intensity metrics for reporting on the climate-impact of their portfolio whereas GHG emissions reporting is rarely provided in green bond reporting. Impact reporting therefore has to be developed not only for green bonds, but in a broader context of green finance, portfolio and climate disclosures.

Furthermore, financial actors and research centers are currently working towards scenario-based analyses to assess the impact of climate-related risks and opportunities on the financial performance of corporate actors. Therefore, in order for green bonds' reporting to be able to feed in the analysis of the "greenness" of financial portfolios in the near future, impact reporting for green bonds should also focus on a measure of the degree of alignment with a 2°C trajectory of the issuing entity and not only the labelled assets. Methodologies still need to be developed in order for green bonds' reporting to go further than simply checking 'use of proceeds' against a simple taxonomy or reporting on a single indicator of GHG emissions.

The European Commission has started to look into ways how standardization could spur the sustainable growth of the green bond market and a recent study advised to explore how a common 'European Green Bonds Standard' could underpin this objective (European Commission 2016) Implementing the TCFD recommendations could potentially allow the evaluation of 'greenness' of any corporate bond, which would be a significant step forward from the current coverage of green bonds that account for a tiny fraction of the overall debt market. France has already pioneered regulations for climate-related financial disclosures with the Article 173 of the Energy Transition Law, although so far the application results have been mixed (INDEFI 2017). The HLEG has acknowledged that 'an EU-wide equivalent of France's Article 173, or an obligation to disclose how sustainability is taken into account could boost sustainability investments' (European Commission 2017).

Based on the conclusions above, several areas for future research to support the harmonization of green definitions and bolstering of the impact reporting processes can be identified:

- Detailed evaluation of different climate-related indicators – e.g. GHG intensity or GHG emissions reductions against a baseline – and the assessment of how each indicator could or could not contribute to aligning financial portfolios with the LCCR transition;
- In-depth analysis of the additional burden in terms of transaction costs that issuers would have to incur should the green bond market move towards a more robust MRV system, such as the one used by the UNFCCC under the CDM;
- Assessment of different policy options to encourage or mandate climate-related financial disclosures across the financial sector beyond the green bond market, which could in turn help address the "zero-sum" nature of green bonds.

Summary Note Bibliography

- Bellassen, V., N. Stephan, M. Afriat, E. Alberola, A. Barker, J-P. Chang, C. Chiquet, et al. 2015. "Monitoring, Reporting and Verifying Emissions in the Climate Economy." Nature Climate Change 5 (4):319–328.
- CBI. 2017a. "Bonds and Climate Change: The State of the Market in 2016." Climate Bonds Initiative. https://www.climatebonds.net/resources/publications/bonds-climate-change-2016.
- ———. 2017b. "Post-Issuance Reporting in the Green Bond Market." Climate Bonds Initiative. https://www.climatebonds.net/files/files/UoP_FINAL_120717.pdf.
- European Commission. 2017. "Financing a Sustainable European Economy." Interim Report by the High-Level Expert Group on Sustainable Finance. https://www.e3g.org/docs/17_Jul_13-sustainable-finance-report_en.pdf.
- INDEFI. 2017. "Article 173 et Institutionnels: Un Bilan Nuancé Pour Le Premier Exercise." http://www.indefi.eu/uploads/medias/actualites/documents/251-infocus-indefi-article-173-juillet-2017.pdf.
- 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.
- Shishlov, Igor, Morgane Nicol, and Ian Cochran. 2017. "Environmental Integrity of Green Bonds: Stakes, Status and next Steps."
- TCFD. 2017. "Recommendations of the Task Force on Climate-Related Financial Disclosures." Final Report. Task Force on Climate-related Financial Disclosures. https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf.

Our Last Publications

- Hainaut, Hadrien, Lola Gouiffes and Ian Cochran "Landscape of Climate Finance, 2017 Edition" I4CE - Institute for Climate Economics, December 2017 https://www.i4ce.org/download/landscape-of-climate-finance-in-france-2016-edition
- Nicol Morgane "What do TCFD's recommendations bring to the public debate on climate risks?" I4CE - Institute for Climate Economics, Février 2017. https://www.i4ce.org/15852-2/
- Nicol Morgane, et Ian Cochran. "Why should financial actors align their portfolios with a 2°C pathway to manage transition risks?" Climate Brief n° 44. I4CE - Institute for Climate Economics, 2017. https://www.i4ce.org/download/gestion-risques-climatiques-financiers/.
- Nicol, Morgane, et Ian Cochran. "How could financial actors manage their exposure to climate risks?" Climate Brief n° 45. I4CE - Institute for Climate Economics, 2017. https://www.i4ce.org/download/gestion-risques-climatiques-financiers/.
- Nicol, Morgane, and Ian Cochran. "How should financial actors deal with climate-related issues in their portfolios today?" Climate Brief n° 46. I4CE - Institute for Climate Economics, 2017. https://www.i4ce.org/download/three-notes-on-the-management-of-climaterelated-risks-by-financial-actors/.
- Shishlov, Igor, Romain Morel, et Ian Cochran. "Beyond Transparency: Unlocking the Full Potential of Green Bonds." I4CE - Institute for Climate Economics, Juin 2016. http://www.i4ce.org/download/beyond-transparency-unlocking-the-full-potential-of-green-bonds-2/.

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