

# Great Expectations

*Credibility and Additionality  
of Green Bonds*



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## Acronyms and abbreviations

ABS	Asset Backed Security
ADB	Asian Development Bank
AfDB	African Development Bank
AKI	Arbeitskreis Kirchliche Investoren / Working Group of Church Investors
BIS	Bank for International Settlements
BNDES	Banco Nacional de Desenvolvimento Econômico e Social / Brazilian Development Bank
BREEAM	Building Research Establishment Environmental Assessment Methodology (British system for assessing environmental and social aspects of building sustainability)
BRF	Brazilian Food
CBI	Climate Bond Initiative
CDM	Clean Development Mechanism
CER	Certified Emission Reduction Credits
DAC	Development Assistance Committee (of the OECD)
EIB	European Investment Bank
EKD	Evangelische Kirche in Deutschland / Protestant Church in Germany
FMO	Netherlands Development Finance Company
FNMA	Federal National Mortgage Association
FSC	Forest Stewardship Council
GBP	Green Bond Principles
ICMA	International Capital Market Association
IFC	International Financial Corporation
ILO	International Labour Organization
ISO	International Standards Organisation
LEED	Leadership in Energy and Environmental Design
MASEN	Moroccan Agency for Sustainable Energy
MNRE	Ministry of New and Renewable Energy
NAMA	Nationally Appropriate Mitigation Actions
NDCs	Nationally Determined Contributions
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
SPO	Second Party Opinion
SPV	Special Purpose Vehicle

# Executive Summary

Since 2007, investors have been able to purchase green bonds, fixed-income securities whose revenues are only invested in environmental and climate protection projects. These bonds are very popular, so that the demand from investors tends to be higher than supply. However, some criticism of them has been voiced. This study will look at the two points of criticism most often raised in regard to green bonds. First of all they have been criticised for their lack of transparency and credibility. Secondly there is some doubt as to whether green bonds do actually generate additional capital for projects that have ecological merit (additionality).

In order to examine the criticism directed towards green bonds, the green bonds projects listed online in the second half of 2017 were examined.<sup>1</sup> It was noticeable that well over half of all the issuers of green bonds provided no reports or only scanty reports about their projects. In a second step, the 2,827 projects published by issuers were divided into categories and the possible controversies for each category were identified. The result was that 57 controversial projects were found. Since it was noticeable that a very large number of eucalyptus plantations in Brazil are being financed via green bonds, a separate expert analysis was compiled for these projects.

To examine the question of additionality, two very different studies were presented. One comes to the conclusion that green bonds are only able to generate marginal amounts of additional capital for green projects. This means that there is merely weak additionality, which comes about because, due to the high demand for such bonds, issuers are on average able to negotiate slightly better conditions when issuing them. The second study comes to the conclusion that “use of proceeds” bonds do not generate any additionality, but that green bonds and asset-backed securities (ABS) do.

In order to investigate the additionality of green bonds, initially two definitions of additionality were considered for this study, the definition used by the Clean Development Mechanism (CDM) and the definition used

by the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD) for development banks. These two definitions were tested to see how well they can be used to investigate green bonds. It was found that the CDM definition was not suitable for examining the additionality of green bonds, but that some parts of the DAC definition can be used for green bonds.

When you look at whether capital from green bonds is used more for projects in countries with higher financial risks, then you see that, in some middle-income countries, that is indeed the case. Overall, the proportion of private green bonds in all private bonds issued is roughly equal in countries with a good and in countries with a medium financial rating. However, individual countries show a significantly higher proportion of green bonds. Backed by statements made in particular by Indian issuers of green bonds in the field of renewable energies, this is an indication that, for countries in the global South, green bonds have the potential to ease their access to the international capital markets and thus generate additionality. However, this is only true for middle-income countries, low-income countries scarcely benefit at all from green bonds.

If you consider the greatest potential so far for generating additionality with green bonds, the findings are as follows: it clearly makes good sense to combine issuing green ABS and financing in middle-income countries. Green bonds will develop the greatest additionality if they generate capital for green projects in middle-income countries via ABS structures. Since this variation also entails high risks, e.g. currency risks, development banks should provide targeted support here. Besides providing assistance with currency guarantees, they could use their expertise in regard to financing projects in the global South to issue and offer ABS to institutional investors.

<sup>1</sup> This means that all the projects put online by issuers of green bonds since 2007 and not deleted up to the end of 2017 were used for this study.



# 1 Green bonds – the political setting

„The opportunity to increase the issuance of green bonds, which still accounted for less than 0.10% of the global outstanding debt and 0.20% of the yearly issued debt in 2015, is not only a major issue but is also consistent with political ambitions and financial players' recommendations.“ (Zerbib 2017: 29). Huge volumes of funding are needed to finance environmental and climate protection. Energy generation must be switched from fossil fuels to renewables. Private and commercial energy consumption must be significantly reduced through efficiency measures. At the same time, supplies of clean water must be secured, buildings and transport must be made climate friendly, and biodiversity must be protected. The sums required to do all this are estimated at 95 trillion US dollars from 2015 to 2030 or about 7 trillion US dollars per year (2° Investing Initiative 2018: 2). A large share of this capital investment will need to come from private investors rather than from the public sector.

The hope is that green bonds will be a suitable instrument for contributing in a major way to meeting this need for financing. The background paper drawn up by the Green Finance Study Group of the G20 in 2016, for example, sums up the advantages of green bonds for

public and private sector investments in green infrastructure as follows:

1. Providing an additional source of green financing.
2. Enabling more long-term green financing by addressing maturity mismatch.<sup>2</sup>
3. Enhancing issuers' reputation and clarifying environmental strategy.
4. Offering potential cost advantages if and when government incentives are used.
5. Facilitating the “greening” of traditionally brown sectors.
6. Making new green financial products available to responsible and long-term investors.

Given these expectations, it is important to look more closely at whether and how green bonds can and do meet these requirements. To do this the study investigates two aspects of green bonds. First of all, using an analysis of the projects financed via green bonds, it examines their credibility in principle. Secondly, it looks at how well green bonds actually fulfil the expectation of generating more capital for environmental projects (additionality).



*For the transition from fossil fuels to renewables huge volumes of capital will be needed - photo: Tobias Scheck/Flickr.com*

<sup>2</sup> Maturity mismatch occurs when capital is invested short term but lent long term. What this means here is that green infrastructure projects need long-term capital because their high initial costs mean that it takes several years before they show a profit. Since bonds tie up investors' capital for a longer period, they are fitting for these kinds of projects.

## 2 Fixed-income securities – the world's biggest capital market

Bonds are issued by companies and banks (issuers). They are basically loans that are passed on via a bank to investors in tranches of a few thousand euros. The bank does not carry the loan itself or the associated risk on its books, but instead arranges for the loan which has been divided into tranches to be sold to investors. It does the job of documenting the economic data, drawing up the sales brochure and arranging a subscription phase, during which investors can express their interest in the bonds within a time period and price span determined by the bank. Once the subscription phase ends, the tranches are sold to the investors. After that they are traded on the stock market, the so-called secondary market. The price on the secondary market fluctuates, above all depending on the interest rate level. If it rises, the price of bonds with a lower interest falls and vice versa. The price of bonds can also fall if the issuer is given a worse financial rating. Particularly in the case of smaller bond issues it is possible that they will all be taken up by a single investor or a small group of investors (private placement).

In economic terms, bonds like shares are a way to raise capital without having to depend on banks' financing capacities. It is not the banks but the investors who buy the bonds who provide the capital and thus bear the risk. They in turn protect themselves via the rating that financial rating agencies give the bonds. The rating shows them how high the likelihood is that the issuer will default. Investors like pension funds, insurance companies and foundations, which pursue a more long-term approach to investment, are particularly

fond of bonds, because they generally involve less risk than shares and because their returns are predictable for many years due to the fixed interest rates.

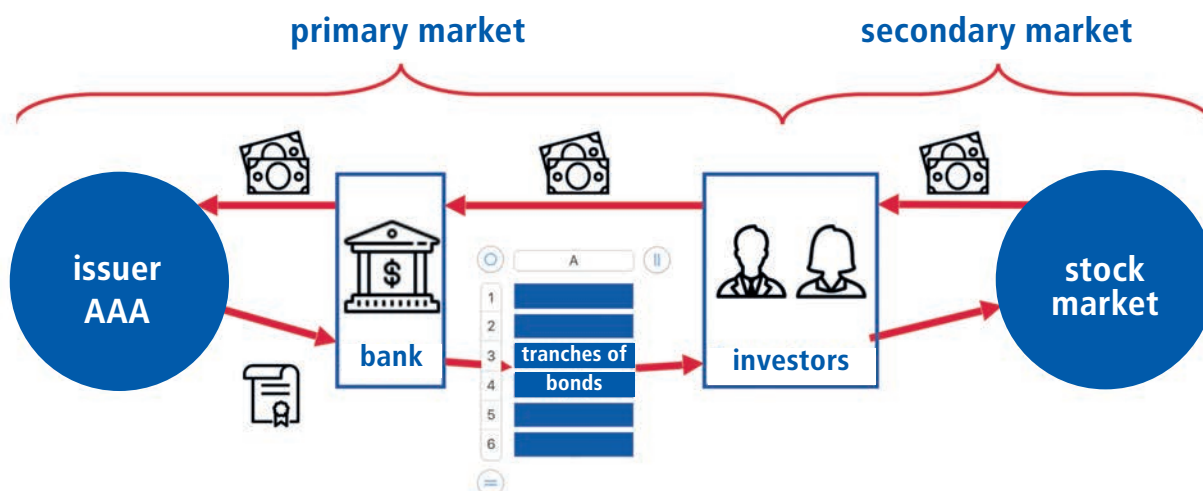
The bond market is by far the biggest sector of the global financial markets. It is estimated to be worth 100 trillion US dollars. The global shares market, on the other hand, is worth only 20 trillion US dollars. Green bonds, which are offered under that name, accounted for about 343 billion US dollars at the end of 2017, which is only 0.3% of the entire bond market (CBI and own calculations)



*The USA, China and France are the countries with the highest volume of green bond issues - photo: Thomas Hawk/ Flickr.com*

The USA, China and France are the countries with the highest volume of green bond issues, followed by Germany, the Netherlands, India and Canada (CBI 2017a: 9).

**Fig. 1: This is how a bond issue works**



### 3 Different kinds of green bonds

Green bonds are bonds whose yield is only used for certain projects with environmental merit. In 2007, the European Investment Bank (EIB) issued the world's first-ever green bond. This came about because in 2006 the European Commission adopted a European Strategy for Sustainable, Competitive and Secure Energy. To this day the green bonds issued by the EIB are an important instrument for the implementation of this strategy. Since then, the idea of raising capital based on the promise that it will only be used in certain „green“ categories of projects has spread across the entire globe (CBI 2017a: 3).

With these particular green bonds the entire company or the entire bank guarantees the redemption of the bonds. This means that revenues from less environmentally friendly activities by the company can also be used to redeem the bonds. However, the company makes sure, via internal processes, that the green bonds money is only allocated to the previously defined sustaina-



*Green bonds are bonds whose yield is only used for certain projects with environmental merit - photo: UNIDO/Flickr.com*

The issuers of green bonds can be divided into public and private entities: the public issuers include national governments and sub-national authorities such as federal states or municipalities and their not-for-profit enterprises, and national public banks. Multilateral development banks like the European Investment Bank and the World Bank also regularly issue green bonds. The private issuers of green bonds include commercial banks, mortgage banks and private companies, e.g. from the renewable energies sector.

A distinction can be made between three kinds of green bonds. The most common type by far is the „use of proceeds“ bond. They account for about 95% of all green bonds issued (2° Investing Initiative 2018: 4).

ble projects. It is decided beforehand what categories of projects are allowed and which departments are involved in the selection process. These bonds are generally listed on the stock market, so they can be traded daily. A special kind of green bond is called a note. Its security also depends on the creditworthiness of the issuer, but it is not freely traded.

The second kind of green bonds are asset-backed securities (ABS). In this case, investors invest in a pool of assets that create an income. The security of the investment depends solely on the payment streams from these assets. The proportion of ABS in green bonds was about 5% in the period from 2007 to 2017 (CBI 2017e: 1). However, this year (2018) the proportion has risen shar-



ply, since the US government's Federal National Mortgage Association (FNMA) issued a total of 27.6 billion US dollars in ABS in 2017. They are to be used to finance measures to reduce energy and water consumption in American apartment blocks (Fannie Mae 2018: no p.).

The third kind of green bond is like a mortgage bond and is also known as a green mortgage bond. The yield comes from a pool of mortgage loans for environmen-

tally friendly properties. Besides the payment commitments there is a right of recourse to the bank that has the loans on its balance sheet and therefore bears the risk. If the defaults on the mortgages are higher than expected, then the bank must put additional solvent mortgages into the pool. However, the number of green mortgage bonds is miniscule.

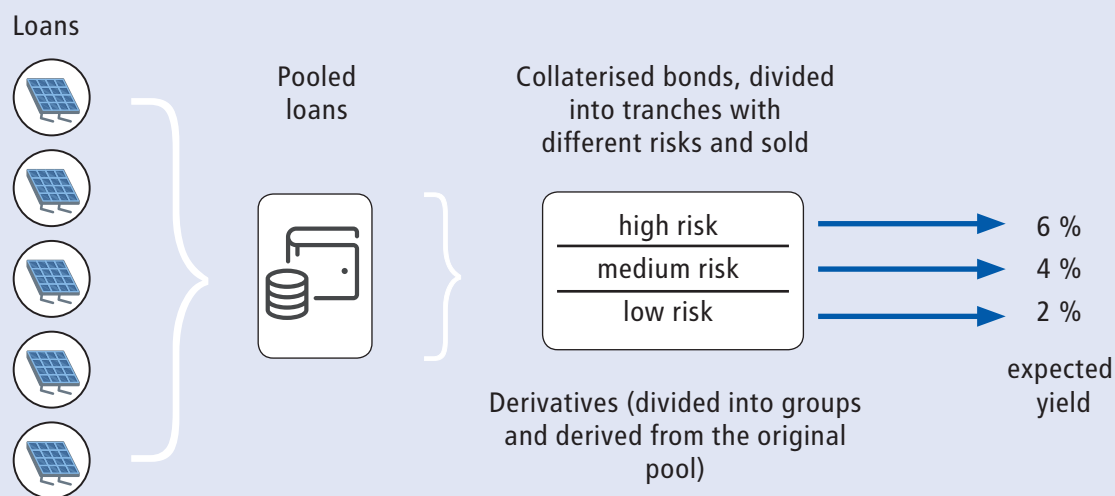
### How does an ABS work?

The innovation of the ABS is that payment obligations become securities that can be traded. Traditionally, securities that can be bought and sold have been shares or bonds issued by companies, banks and governments. Loans for buying homes, cars or solar panels, on the other hand, are not backed by such a financially strong issuer with a public balance sheet. They are secured by payment flows that have been contractually agreed. These are usually many individual loans, e.g. mortgages or business loans. For an ABS, after they have been issued by a bank these loans are sold to a Special Purpose Vehicle (SPV) that has been set up specially for this purpose. The SPV converts them into securities, in this case ABS.

For an outside investor it is almost impossible to judge the risk of this kind of ABS, which is made up of a bundle of loans. The Special Purpose Vehicle

therefore proceeds as follows when converting the loans into securities: it divides the converted loans into tranches with different levels of risk, which are evaluated by financial rating agencies. There is usually a secured (very safe), a middle (medium safe) and an unsecured (not very safe) tranche. The unsecured tranche bears the first defaults. Only when the assets of this tranche have been exhausted will the middle and finally the secured tranche bear losses. The unsecured tranches thus serve to strengthen the security of the money in the higher tranches. Investors can buy these bundles and receive the payments from the loans on which they are based. In the event of a default they also have access to the asset, e.g. the house that has been mortgaged.

**Fig. 2: Collateralised Debt Obligations – how they work**





## 3.1 Green project categories

The issue of a green bond entails a promise that it is linked to sustainable activities. In order to keep that promise, it is necessary first to define what sustainable activities are. Currently there are voluntary approaches for such definitions or, as in the case of China and India, there are official definitions. On the financial markets side, banks and asset managers have developed under the umbrella of the International Capital Market Association (ICMA) the Green Bond Principles (GBP). These principles say that, where possible, a green bond must include information about what the proceeds from the bond will be used for. In addition to this information about how the funds will be used, there must be a process for evaluating and selecting the projects, the separate administration of the funds must be ensured and special reporting must be available. The core of this voluntary self-regulation is a list of project categories that are suitable for financing with green bonds.

### The ten categories of the Green Bond Principles:

1. Renewable energy
2. Energy efficiency
3. Pollution prevention and control (including wastewater, CO<sub>2</sub>, soil remediation, waste prevention, waste recycling and energy / emission-efficient waste to energy)
4. Environmentally sustainable management of living natural resources and land use
5. Terrestrial and aquatic biodiversity conservation
6. Clean transportation, including hybrid vehicles
7. Sustainable water and wastewater management
8. Climate change adaptation
9. Eco-efficient products, production technologies and processes
10. Green buildings which meet regional, national or internationally recognised standards or certifications

(ICMA 2018: 4)

However, a list of categories alone is not enough. In order to actually prevent the funding of projects and products that are ultimately damaging to the environment, the categories need to be more closely defined. For example, although hydroelectric power plants fall under the category of „renewable energies“, they can entail large-scale destruction of primary forest. Similarly, not every electric car is climate friendly. What counts is how much CO<sub>2</sub> is emitted in producing the electricity used to power the car. The CBI has therefore developed a certification system to define detailed criteria for the individual categories. These criteria must be met in order for a project or product to be financed with a CBI-certified green bond.



*Is funding hydroelectric power plants with green bonds a sustainable activity? Photo: Pavel Karafita/Flickr.com*

**Table 1: The sum of roughly 343 billion US dollars invested in all the green bonds issued up to the end of 2017 was used in the following areas:**

Renewable energies	40%
Energy-efficient buildings	29%
Environmentally friendly transport	15%
Water infrastructure	7%
Nature conservation	3%
Industrial energy efficiency	3%
Processing waste	2%
Adaptation to climate change	1%

*Source: own calculations based on CBI data*

Another approach in order to underpin the credibility of a green bond involves getting a second party opinion (SPO). The issuer commissions the SPO from an agency. The agency finds out how the issuer keeps the funds from the green bond separate from the company's other flows of funds or tags them, gets an insight into the processes for selecting the projects, evaluates the information available on suitable projects and writes, using

an evaluation system, a report on its findings. This procedure is the one now chosen by most issuers in order to give investors an insight into the environmental quality of their bonds. Second party opinions are written by specialised environmental institutes or sustainability rating agencies. Financial ratings agencies like Moodys and Standard & Poors have also developed certification systems for green bonds.

## 3.2 Official government regulation of green bonds

In some countries there are guidelines that must be followed by issuers of green bonds. The Chinese stock market regulator, together with the Chinese central bank, has drawn up a catalogue of activities that are admissible for funding using money from green bonds. Besides renewable energies, numerous measures to reduce emissions, for example also from coal-fired power stations, are listed. The Indian stock market regulator has also drafted a set of rules for green bonds that are closely aligned to the categories of the aforementioned Green Bond Principles. Furthermore, the rules state that issuers shall be required to publish continuous reports about their green bonds projects for the duration of the bond.<sup>3</sup>

The European Commission addressed the topic of „sustainable finance“ and capital markets in 2016. An expert group published its report in early 2018 with proposals for ways to support sustainable financing in Europe, including by using green bonds. This report looks at the problems of transparency and of the additionality of green bonds. These two points are to be covered in a further regulation for green bonds.

Many of these recommendations have been included in the Action Plan: Financing Sustainable Growth for the EU. The Plan seeks to achieve a broad-based regulation which will strengthen investments in sustainable economic activities. This includes setting up an expert group for green bonds that will draw up a proposal by the middle of 2019 for an EU norm for green bonds. Furthermore, the European Commission will establish regulations for the contents of issuing prospectus for green bonds (European Commission 2018a: 16).

A first step towards implementing this EU project is the establishment of a „framework to facilitate sustainable investment“ (European Commission 2018b). With regard to green bonds, the topics of a classification system (taxonomy) for green investments published in this document are particularly significant, because they outline what constitutes a sustainable investment in the eyes of the European Commission and therefore also what kind of investments green bonds can be used for. The European Commission is taking a step-by-step approach to this endeavour. First there will be a detailed definition of climate-friendly investments, then for environmentally friendly and finally for socially responsible investments.



*Green bonds in China are regulated by government guidelines - photo: Scott Brown/Flickr.com*

<sup>3</sup> Regulations for green bonds drawn up by the Securities and Exchange Board of India: [https://www.sebi.gov.in/legal/circulars/may-2017/disclosure-requirements-for-issuance-and-listing-of-green-debt-securities\\_34988.html](https://www.sebi.gov.in/legal/circulars/may-2017/disclosure-requirements-for-issuance-and-listing-of-green-debt-securities_34988.html) (last access: 26.09.2018).

Press release on regulations for green bonds from the China Securities Regulatory Commission: [http://english.gov.cn/state\\_council/ministries/2017/03/03/content\\_281475583659044.htm](http://english.gov.cn/state_council/ministries/2017/03/03/content_281475583659044.htm) (last access: 12.10.2018).

The headings in the framework from May 2018 relate to general environmental issues. There are many overlaps with the GBP.

However, there are three significant differences. First, the EU is looking at the topic of the circular economy and explicitly striving to achieve a reduction in waste incineration, whilst the GBP include waste incineration for the purpose of generating electricity in their catalogue as an example for the category “pollution prevention and control” and do not mention the circular economy. Second, the EU explicitly excludes environmentally harmful activities like the inefficient use of resources and the use of certain chemicals, whilst the GBP do not. Third, activities that count as suitable for sustainable investments according to the EU must meet certain minimum social criteria. These include the eight core labour standards of the International Labour Organization (ILO), which cover aspects such as trade union freedom, a ban on discrimination, and a ban on child and enforced labour (European Commission 2018b: 7). This means that the EU definition of “green finance” is more ambitious than the GBP categories and unlike them sets limits which may not be breached for sustainable investments.

Besides the official regulations in China, India and the EU, the International Standards Organisation (ISO) is working on a standard for green bonds (ISO 14030), which is due to be completed in 2020 (ISO 2018: 45).

These voluntary and official regulations give financial market actors guidance. Issuers know what expectations they must meet with green bond issues and investors know what content and processes constitute a green bond.

That is why the Green Bond Principles and their categories were a particular reason for the rapid growth in the annual volume of issues from 2.5 billion US dollars in 2010 to about 155.5 billion US dollars in 2017.

**Table 2: Annual global issues of green bonds**

Year	Bn US dollars
2010	2.5
2011	0.9
2012	2.0
2013	9.3
2014	28.9
2015	37.0
2016	81.0
2017	155.5
up to September 2018	104

Source: CBI

## 4 Information gaps and credibility of green bonds

Despite the way that the development of standards has contributed to successfully increasing the volume of green bonds issued, the standards have brought problems for existing systems for sustainable investment, especially because two circumstances were not considered.

1. First, sustainable or ethical investors had already developed criteria on which to base their investments in the 1990s. Besides environmental and climate protection, these criteria included a whole range of other requirements to be met by sustainable investments in the widest sense. For example, the first assessments of companies by the sustainability rating agency oekom in 2000 were based on the Frankfurt-Hohenheimer Guideline, which was drawn up in dialogue with scientists and NGO representatives. Today, apart from ecological topics, they cover other controversial points like armament, nuclear power, corruption and the violation of labour laws, but

also positive points like promoting women. Today, this system, which has been continuously developed over the years, influences investments worth 1.15 trillion euros.



Promoting women worldwide as a criterion for sustainable investment - photo: UN Women/Ryan Brown/Flickr.com



In 2011, following an internal discussion process, the Arbeitskreis Kirchliche Investoren (AKI - Church Investors Working Group) of the Evangelical Church in Germany (EKD) also published a guideline with a comprehensive catalogue of criteria for and against investments to guide the financial departments in each federal state and pension funds in making investment decisions.

These are just two examples of the numerous other comprehensive catalogues of criteria for sustainable investment. However, most of these criteria play little role in the current discussion about green bonds. This means that investors who have already integrated these systems into their guidelines cannot buy green bonds sight unseen.

2. Furthermore, sustainability rating agencies have successfully introduced a new business model for assessing companies that consciously avoids the conflict of interest that conventional rating agencies are often accused of. Under this model the sustainability ratings are paid for by investors and not by the issuers of the bonds. With the second party opinions (SPOs) and the certification of green bonds, it is again issuers who pay for their rating. Sustainable investors who have learned to appreciate the inde-

pendent analysis provided by sustainability rating agencies understandably distrust these new certifications.

These two circumstances make it obvious that sustainable investors have an interest in comprehensive documentation on green bonds. They need to know whether a green bond also conforms to their own comprehensive social and ethical criteria. Furthermore, they must have another way to test the credibility of a green bond apart from an SPO paid for by the issuer. For this they need concrete information about the projects that are financed via a green bond.

The GBP address these needs of sustainable investors and recommend that the projects financed via a green bond should be disclosed (ICMA 2018: 5). In practice, however, only fewer than half of all issuers follow this recommendation.

In order to get an impression as to whether the information publicly available meets the needs of sustainable investors and to examine the credibility of green bonds using the available information, for this study green bonds disclosed online in the second half of 2017 and their projects were analysed.<sup>4</sup>



*The recommendation of the Green Bond Principles: Disclose all projects financed via green bonds - photo: Dana Smillie/World Bank/Flickr.com*

<sup>4</sup> See footnote 1



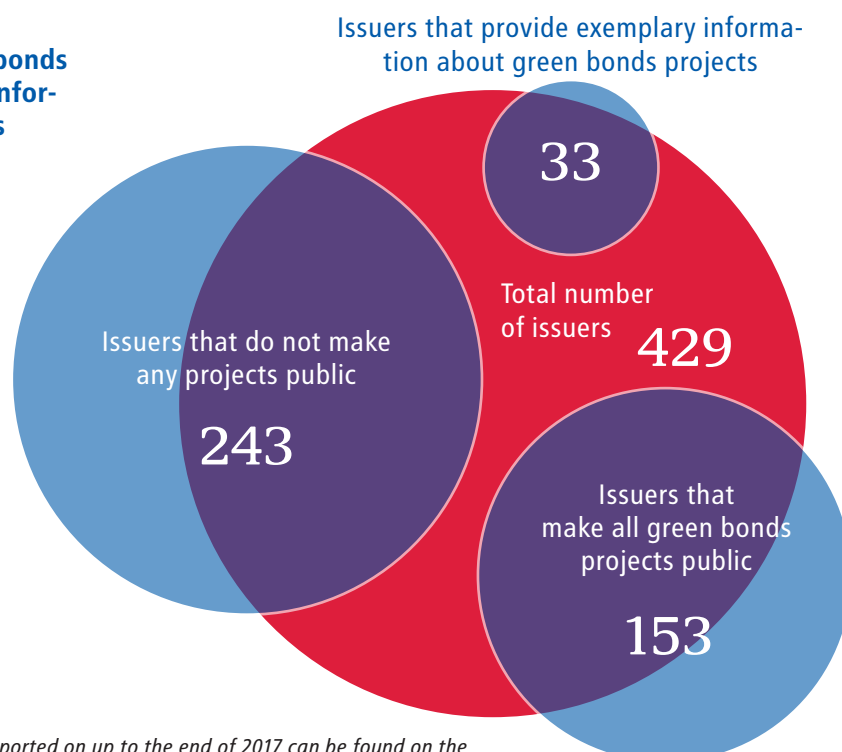
## 4.1 Green bonds projects – an imperfect overview

Research carried out by SÜDWIND revealed that, up to the end of 2017, of the roughly 429 issuers, a mere 186 issuers informed the public about projects financed via green bonds. A total of 153 of them publish information about all or most of their projects, the others only describe some examples of projects online. The most comprehensive reporting is provided by development banks, in particular the European Investment Bank (EIB). It describes all its green bonds projects on its website, says which green bond they are associated with and how much is invested in each individual project. The World Bank and the Netherlands Development Finance Company (FMO) offer similarly detailed reports.

Of the private issuers, a mere 79 provide information about individual projects. Producing companies however, such as the company Brazilian Food (BRF), go into the same sort of detail as the development banks. Private banks, on the other hand, mostly refrain from providing detailed information. They generally do not reveal, for example, the amounts invested in individual projects. As a result, it is generally not possible to see how much green bonds cash is being invested in the various categories of projects.



**Fig. 3: Only a minority of green bonds issuers provide comprehensive information about individual projects**



Source: own research. The lists of projects reported on up to the end of 2017 can be found on the SÜDWIND website at: <https://www.suedwind-institut.de/index.php/de/publikationen-366.html>

## 4.2 Problem areas

Up to the end of 2017, a total of 2,827 green bonds projects were listed online. In order to examine the credibility of these projects they were first divided into categories. In a second step the study identified the biggest environmental and social risks linked to each category

and investigated what information about controversies in the different categories was available for which projects. There were 57 problematical projects out of the total of 2,827.

**Table 3: Problematical green bonds projects listed by category**

Category / sub-category	Number of projects	Possible controversies	Number of problematical projects
Renewable energies in general	16		
Wind energy	447	Land rights conflicts / nature conservation	5
Solar power (photovoltaics, concentrated solar power (CSP))	200	Conflicts with the local population	
Hydroelectric power: Northern Europe / North America, also dam maintenance	65	Landscape protection / biodiversity	
Hydroelectric power: Latin America, Africa, Asia	68	Land rights conflicts / forced resettlement	2
Geothermal plants	21	Land rights conflicts / groundwater	1
Bio-energy from waste / landfill gas	35	Competition with food crops	
Biomass: eucalyptus / wood pellets	46	Forest use not sustainable	3
Power grids for renewable energy	83	Land rights	1
Buildings	529	Inadequate standards	
Waste water treatment, water treatment, domestic and industrial	740	Protests by people living nearby	
Solid waste treatment / waste incineration	57	Incineration plants	14
Microfinance / supporting SMEs	30	Violation of principles of consumer protection	
Public transport / cycle paths / electro-mobility	167	Transport of coal	1
Private transport, hybrid cars and electric cars	8	CO <sub>2</sub> savings too low	6
Drip irrigation	13	So far no controversies	
Energy efficiency in industrial processes: power-saving lighting, cogeneration	112	Danger of lock-in effects	
District heating	53	So far no controversies	
Timber plantations	10	Land rights conflicts / groundwater	4
Nature conservation	55	So far no controversies	
Climate adaptation	5	Road construction	
Agriculture	15	Agro-chemicals	2
Green / social credit lines	22	Lack of environmental	9
Development in general without environmental benefits	9	benefit and transparency	9
Pollution prevention and control / soil decontamination	14	So far no controversies	
Other	7		
<b>Total:</b>	<b>2,827</b>		<b>57</b>

The 57 most problematical projects can be divided into six categories. First, there are some wind and hydro-power projects financed by green bonds where there have been protests by the local (indigenous) people or human rights violations.

Second, there are investments in the field of „clean transport“ in hybrid cars and in a stretch of railway track for goods trains mainly to transport coal. Third, waste incineration plants are being financed via green bonds. Fourth, the development banks have projects in their portfolios that can indeed have development benefits, e.g. building hotels, but that have no recognisable environmental benefit. Fifth, environmental loans from green bonds are being offered to major companies without their environmental benefit being clear. Finally, it is noticeable that in Latin America private issuers are using green bonds extensively to set up and manage eucalyptus plantations for the production of cellulose.



*Jirau dam in Brazil - photo: Divulgação/Programa de Aceleração do Crescimento/Flickr.com/rau*

**Table 4: List of problematic green bond projects**

Topic	Number of mentions green bonds documents	Countries in which the projects are being
Waste incineration	14	China, Estonia, Germany, Italy, Sweden, UK
Company loans without obvious environmental benefit	10	Japan
Development projects without environmental benefit	9	Armenia, East-Timor, Ecuador, Ethiopia, Ghana, India, Indonesia, Mexico, Nepal, Sri Lanka
Wind power or hydroelectric projects with controversies	8	Brazil, India, Kenya, Mexico
Transport in connection with high CO <sub>2</sub> -emissions	8	Japan, South Africa, USA
Eucalyptus plantations	4	Brazil

The NGO International Rivers describes several blatant deficits with regard to this hydropower project. For example, the possible impact of the dam on tributaries in neighbouring Bolivia and Peru was not considered. Areas of land designated as compensation for the destruction of forest in nature reserves in order to build the dam were significantly smaller than the areas destroyed. The lives of the indigenous population were impacted without them having given their consent to the changes and, finally, 20,000 workers demonstrated against the terrible working and living conditions, and inadequate pay (International Rivers 2012: no p.).

#### 4.2.1 Why are these projects problematical?

Hydroelectric power plants are a source of renewable energy and thus contribute to climate protection. However, large-scale dams in the global South are often accompanied by conflicts about land rights and violations of human rights. This is especially true of Jirau dam in Brazil, which was financed in 2015 via a green bond issued by the French energy concern Engie (previously GDF Suez) (ENGIE 2016: 162).

There have also been local protests against a dam project in Rampur in India that the World Bank financed via a green bond. People fear that the dam will impact negatively on the cultivation of crops for food and will cause food insecurity and destroy the landscape and vegetation (Environmental Justice Atlas 2015: no p.).

The European Investment Bank EIB is financing wind farms in Oaxaca via its green bond. This region on the Atlantic coast is one of the windiest in the world.

Numerous project developers for wind farms have therefore secured the rights to install wind power plants in this region. The EIB states that it is financing the La Venta III wind farm near Santo Domingo Ingenio via a green bond. There have been numerous protests there against the wind power industry. In one case the supreme court enforced a stay of construction because the local people were not adequately included in the planning process (Mexico News Daily 2018). It is not however possible to say with certainty whether La Venta III is directly affected by this controversy.

There have also been protests against the power line that is meant to link Lake Turkana wind farm to the Kenyan capital Nairobi. The wind farm itself is listed as a green bond project by several issuers, including the FMO, EIB and the African Development Bank (AfDB).



*La Venta III wind farm - photo: Francisco Santos/Flickr.com*

Hybrid technology marks some progress towards lower emissions in private transport. However, in the long term it is not a solution for climate-friendly transport. It is already being overtaken by new technologies for public transport and by electric cars. Green bonds that finance sustainable projects should therefore invest in solutions with long-term acceptability and not in interim solutions.

Issuers from China, Great Britain, Sweden, Germany and Italy list a total of 14 waste incineration facilities that are being financed via various green bonds. Waste incineration is seen as a borderline case. Waste contains bits of organic matter like paper or food that are renewable. But waste also contains products like plastic packaging that are oil-based. Furthermore, in certain situations, waste incineration leads to counterproductive incentives, making efforts to avoid or recycle waste obsolete.

The organisation Bank Track, for example, investigated a waste incineration plant in Estonia financed via a green bond issued by the EIB and discovered that its design, with a potential capacity of 220,000 tonnes per year, is big enough to burn 60% of all household waste in Estonia. This is also the quantity that would need to be processed in order to run the facility at a profit. If the plant only takes waste from Estonia there would only be 40% of household waste left in the country to be recycled. This would not be in line with the EU target of recycling 50% by 2020 (Friends of the Earth US, Bank Track, International Rivers no yr.: no p.).

In the list of green bonds projects issued by the FMO and the World Bank subsidiary International Finance Corporation (IFC) there are a few projects whose environmental benefit is not clear. For example, the funding of hotels, of an oil and gas terminal, and of a producer of artificial fertiliser are listed. There can be developmental value in financing these projects. However, there is no evidence of additional environmental benefit, for example in the case of the hotel that it is to be built using environmental construction methods. Yet, without additional environmental benefit, financing these projects via green bonds is questionable.

Finally, it is striking that environmental loans funded via a green bond are granted by the Japanese development bank to conventional businesses, some of them from the chemicals sector and from heavy industry, without the exact purpose of the loans being clear.

### 4.2.2 Case study of eucalyptus in Brazil

When you look at private issuers of green bonds in Brazil, it is noticeable that, apart from two smaller issues by private companies that are engaged in renewable energies and issues by the food producer BRF, green bonds are mainly issued by the three major cellulose producers Suzano, Fibria and Klabin.<sup>5</sup> It is precisely these three companies that are the issuers of the green bonds used to generate 82% of the green funding raised by the private sector in Brazil.

The business model followed by these three or after the merger of Fibria and Suzano these two companies consists of operating very large-scale plantations of quick-growing eucalyptus trees that are harvested and turned into cellulose or sometimes further processed into paper in nearby factories.

<sup>5</sup> According to the Brazilian development bank Banco Nacional de Desenvolvimento Econômico e Social (BNDES) a merger between Fibria and Suzano is expected shortly, which would make them the world's biggest cellulose producer. Here they are still treated as two separate companies.





It is thanks to these companies that Brazil is now the second biggest producer of cellulose after the US. About 7.5 million hectares of land in Brazil are cultivated as eucalyptus plantations. Suzano farms 570,000 hectares and Fibria 656,000 hectares of eucalyptus plantation, and Klabin owns 229,000 hectares of eucalyptus and pine tree plantations. These companies state that the land was degraded before it was converted to this use. All three companies have repeatedly faced land rights conflicts in the past. Indigenous population groups and descendants of Brazilian slaves who were awarded land rights have protested against the companies using land to which they have a claim. In the federal states of Minas Gerais, São Paulo and Bahia there are likewise ongoing conflicts because of the high amount of water consumed by eucalyptus plantations. There have been protests from small farmers because the plantations are lowering the groundwater level and thus robbing them of their livelihoods. In addition, the plantations are sprayed with agricultural pesticides from the air. Faced with these protests the companies have switched to Mato Grosso do Sul to expand their activities, where 500,000 additional hectares altogether have been planted with eucalyptus since 2010.

As far as it is possible to tell, the areas funded via green bonds are mainly in Mato Grosso do Sul, where there have not been any conflicts over land rights or increased water use so far. Furthermore, the companies state that the capital raised via green bonds is only used for plantations certified by the Forest Stewardship Council (FSC). However, the FSC criteria for this kind of plantation are contested. They are monocultures without any undergrowth. Only part of the area, mostly more inaccessible slopes, is not cultivated. Fungicides to fight pests are sprayed from planes, although this can have negative impacts on useful insects.

Suzano and Fibria in particular are working intensively on using genetically modified species of eucalyptus. Suzano, for example, has bought the company FuturaGene and is investing in research into genetically modified plants. Besides laboratory research, field trials have now been started. According to FSC rules, the label cannot be given to companies that use gene technology. In the case of Suzano the FSC argues that the trials are small-scale field trials and that genetically modified trees are not used regularly and so it continues to award the label. It is debatable what will happen once, as is to be expected, Suzano starts planting large areas with genetically modified trees. If this happens during the lifetime of the green bond and the FSC certification is withdrawn because of it, there would no longer be any reason to label these activities as sustainable and suitable for a green bond.



*Are genetically modified eucalyptus plantations being funded via green bonds? Photo: Capão Bonito/ Flickr.com*

Apart from managing FSC-certified eucalyptus plantations, all three issuers spend a small percentage of the yield from the bonds (between 0.9 and 1.4%) on nature conservation or on the restoration of degraded land. However, it very much looks as if they only do that to meet the requirements of Brazilian legislation, namely that between 20 and 50% (depending on the location) of the area used by plantation owners must be left in its natural state.

Fibria's green bonds report shows furthermore that more than 50% of the capital was used to buy in certified timber.<sup>6</sup>

**Table 5: Disposition of Fibria green bonds**

Sustainable forest management 2015 – 2017	Expenditure in millions of US dollars	Expenditure as a %-age
Forest maintenance	50.8	14
Forest protection and management	114.3	32
Buying certified timber	184.6	52

Source: Kuhlmann 2018: 8

Whereas in the second party opinion the focus is on setting up new plantations, in fact to date half the capital raised has been spent on buying in timber. That is not an activity included in the selection criteria for projects funded with green bonds.

This form of plantation cultivation does not offer any recognisable environmental benefit. In terms of protecting biodiversity, the company does only what is required by law and the active research and development activities relating to genetically modified species suggest that the company's activities are more likely to have a negative than a positive impact.

### Questionable calculation of CO<sub>2</sub> savings

What is more, in Fibria's Impact Report, the calculated savings in CO<sub>2</sub> are questionable. The company assumes that during the growth period CO<sub>2</sub> is absorbed and that using the lignin contained in the trees as a fuel creates a saving in fossil fuels. However, the savings thus achieved of 121 tonnes of CO<sub>2</sub> per hectare and per year

appear to be excessive since, the trees are harvested after a mere seven years and are then used for cellulose products with a very short lifespan. If these unfavourable circumstances for the CO<sub>2</sub> balance are included in the calculation then, overall, even taking the diesel savings into account, the maximum CO<sub>2</sub> saving is 72 tonnes per hectare and year, which is about one third of the anticipated savings reported by Fibria.

## Conclusion

The environmental added value of the green bonds issued by Brazilian paper producers is very limited. Ultimately the companies are following practices that are usual for them and comply with the law but that have questionable environmental benefits. The dubious calculation of CO<sub>2</sub> savings and the intensive research into genetically modified trees indicate that the companies are not really interested in an ambitious environmental realignment of their business practices, but instead are using green bonds to finance the slightly less environmentally destructive part (because of it being FSC-certified) of their usual business (Kuhlmann 2018: 1-17).

### 4.2.3 Conclusion: problematical projects

The conclusion to be drawn from this investigation is that the number of problematical green bonds projects, to the extent that they are actually disclosed, is fairly modest. The fear that green bonds are being used on a large scale for investments in environmentally harmful projects was shown to be unjustified for those green bonds projects for which information is publicly available. How the large mass of green bonds projects for which no reporting is available should be judged is not clear. It is likely that their environmental quality is worse than in the case of the disclosed projects.

The fact that some groups of green bonds projects are at the limits of what may still be called sustainable is a serious problem. They are not heralding the start of a change in direction towards a sustainable way of doing business. Instead they are just making existing structures slightly less harmful for the environment. However, the Paris Agreement specifies a comprehensive shift in financial flows (Paris Agreement 2015: 22). Accordingly, the only way to reduce the demand for fresh cellulose from plantations is with a consistent system of recycling for paper and other products, which will also help reduce the demand for incineration.

<sup>6</sup> See Fibria's Green Bond Report: Anticipated Use of Proceeds Attestation, May 2017, Appendix C, page 3.



Another cause for concern is that the capital raised is being used to build new buildings and upgrade the energy standards of existing ones but that they do not meet the highest climate standards. Buildings stand for decades. The highest possible standards should therefore be applied both for new buildings and for energy upgrades. Otherwise buildings built to sub-optimum standards will continue to exist for decades. The only way to avoid a further rise in global energy consumption in buildings is if the highest standards achievable are implemented (Lucon, Ürge-Vorsatz, Zain Ahmed et al 2014: 696). However green bonds used to fund buildings or building upgrades do not generally demand this highest standard. Instead they mostly allow the third-best outcome, e.g. in the case of the rating systems BREEAM and LEED.



*The highest possible standards should be used for new build projects and energy upgrades - photo: Jeremy Levine/ Flickr.com*

Given these findings, it is to be hoped that the European Commission will use its regulatory plans to tighten up the established practices with regard to green bonds. For example, all issuers of green bonds should be required to publish information about their projects and the country where they are implemented, together with the sum invested in each case.

Furthermore, the bar should be set higher for environmental projects. Usual practices or adhering to legal requirements must be the minimum. There should be incentives to go beyond that and to use green bonds to finance more ambitious projects. In particular, there should be an incentive like that for recovering materials as part of a truly circular economy, for ambitious projects in the field of low-carbon public transport and for low-carbon buildings. In the case of electric cars, the source of the electricity used and where the resources used are obtained should also be taken into consideration. It should also not be forgotten that, if the taxonomy developed by the EU offers categories that are easier to realise and others that are harder, then green bond issuers will always tend to focus much less on funding for topics like biodiversity and the circular economy that are difficult to implement.

It is very laudable that the EU intends to establish minimum environmental and social standards for sustainable investments. This should rule out the funding of projects that result in considerable environmental damage and cause human rights to be violated.

## 5 Green bonds and additionality

Given the shortage of public funding, green bonds should be used above all to generate private capital for environmental protection and climate action. The British Climate Bond Initiative, which advocates the rapid expansion of green bonds, notes that: „traditional sources of capital for infrastructure investment (governments and commercial banks) are insufficient to meet capital requirements; institutional investors are increasingly being called upon to fill these financing gaps. (...) Green bonds have emerged as a valuable tool to mobilise the global investment community.“ (CBI 2017c: 2).

Green bonds are given this role in an environment in which the importance of the private sector has grown.

In many OECD countries, the electricity, the water and to a lesser degree the public transport sector have all been liberalised and privatised in the last 30 years. Electricity generating capacity in the public sector has fallen significantly in OECD countries since the 1980s because, particularly in countries like Belgium, Japan, Spain and Great Britain, electricity generation has been extensively privatised (Steiner 2001: 14).

Since the financial crisis in 2008, public budgets have also had less scope for additional spending to improve the enabling environment for renewable energies.

At the same time, the model of feed-in tariffs, which made investing in renewable energies very attractive

for private investors, has been used less often and has been replaced by state-controlled tendering. This has resulted in more competition and led to significantly lower prices for electricity from renewable energies. However, it has also meant that investments in renewable energies have become less attractive.



*Investments in renewable energies have become less attractive - photo: Danish Wind Industry/Flickr.com*

At the same time as the state has been withdrawing from these sectors, all attempts to make activities that harm the climate less attractive via effective taxation of CO<sub>2</sub> emissions have so far failed.

Simultaneously climate scientists have been sounding the alarm with increasing urgency, warning against the impacts of climate change, which can only be limited to an acceptable level if greenhouse gas emissions are consistently and rapidly reduced. That is why, in 2016, almost every country in the world committed to a set of goals to protect the climate.



*Signing of the Paris Agreement - photo: UN Photo/ Mark Garten/Flickr.com*

The Paris Agreement also includes a concrete commitment to redirect global financial flows towards climate-friendly technologies (Paris Agreement 2015: 22).

For many people, green bonds are one of the few rays of hope in this critical situation. The high demand for green bonds and the strong growth in the numbers issued give reason to hope that a functioning instrument has been found which can be used to generate the necessary rapid increase in investments in climate action.

This does not just apply to Europe and the US. In some countries of the global South, like India, China and Morocco, substantial numbers of green bonds are being issued. Since the barriers to funding are often higher in these countries and many project developers have no access to the international capital markets, green bonds are probably even more important in this context than in the countries of the global North.

It is therefore a good sign that the register of Nationally Appropriate Mitigation Actions (NAMA) launched at the climate conference in 2007 in Bali contains projects funded via green bonds. Morocco, for example, is funding a solar-thermal power station that is registered as a NAMA project via a green bond. Projects that are part of the South African Renewables Initiative, also a NAMA-registered venture, are likewise using green bonds for funding. However, the Nationally Determined Contributions (NDCs) established for their countries by the signatories to the Paris Agreement from over 190 nations are less specific than the NAMA, so that it is not as yet possible to establish a direct link to green bonds. It is, however, to be expected that some NDCs will also be financed using green bonds (GIZ no yr.: 10).

This being so, it is essential to gain clarity about the exact contribution that green bonds can make, because the question of whether and to what extent green bonds actually create additionality in this context and how their impact might be improved has not yet been answered. This part of the study will help bring together available findings and give new insights into the additionality of green bonds in the countries of the global South. It initially references only “use of proceeds” bonds, which account for 95% of the market.



## 5.1 Additionality in the sense of the Clean Development Mechanism

Additionality is a term that is used in different contexts. In the case of green bonds, two of these contexts are important for determining additionality. First, projects that are part of the Clean Development Mechanism (CDM) must be shown to be additional and second, public sector national and multilateral development banks are required to provide „additional“ funding.

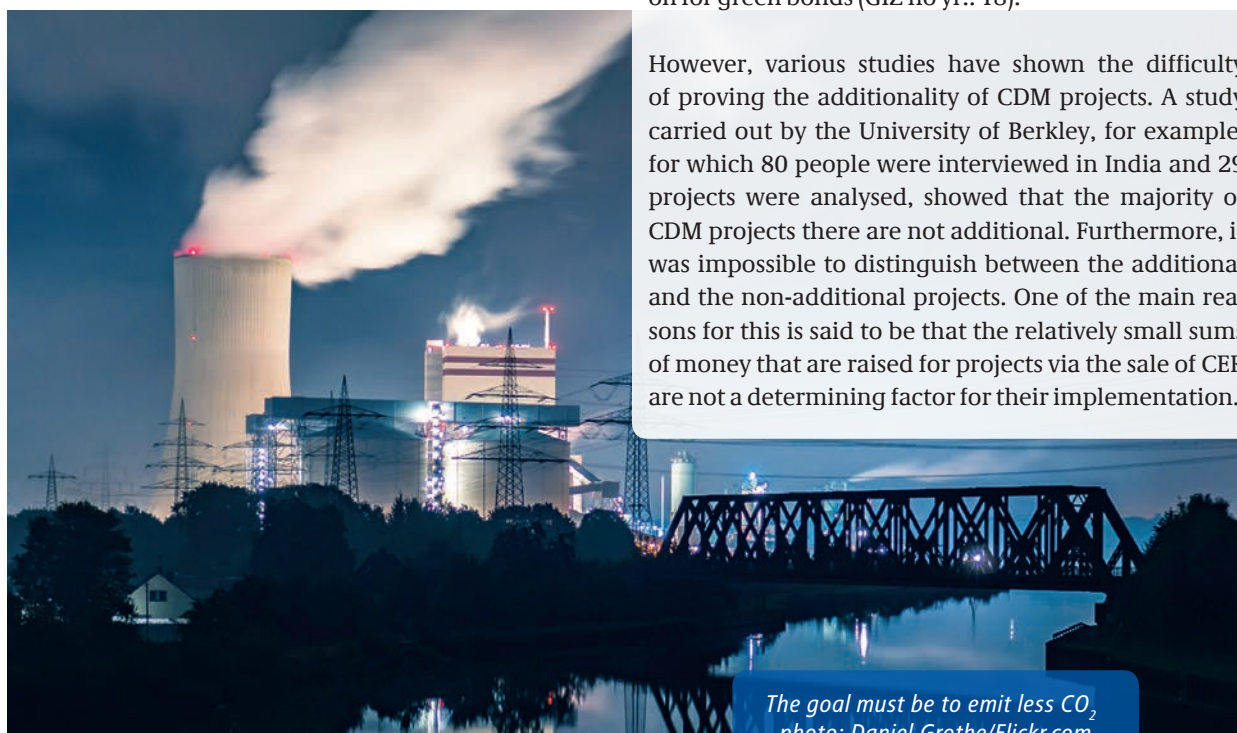
In the first case (CDM), the Kyoto Protocol states that players from industrialised countries, like major chemical companies or utilities providers, can also realise their reduction targets by providing funding for carbon-saving projects in countries of the global South. These projects are assessed and then awarded Certified Emission Reduction Credits (CER). These CER can be bought by players who need emission rights because of the high level of their CO<sub>2</sub> emissions. By purchasing these certificates they are entitled to emit more CO<sub>2</sub>. It is necessary that the CER-generating projects contribute to less CO<sub>2</sub> being emitted as a result of the CER funding.



*Power supply plant in rural Aceh in Indonesia, funded by the Asian Development Bank - photo: Asian Development Bank/Flickr.com*

If there is no such additionality, then this means that the buyer emits more CO<sub>2</sub> without engendering a reduction elsewhere, meaning that altogether more CO<sub>2</sub> enters the atmosphere. That is why CER may only be awarded to projects that would not have been undertaken without this funding and are therefore „additional“. The suggestion has already been put forward that this definition of additionality should be made a criterion for green bonds (GIZ no yr.: 18).

However, various studies have shown the difficulty of proving the additionality of CDM projects. A study carried out by the University of Berkley, for example, for which 80 people were interviewed in India and 29 projects were analysed, showed that the majority of CDM projects there are not additional. Furthermore, it was impossible to distinguish between the additional and the non-additional projects. One of the main reasons for this is said to be that the relatively small sums of money that are raised for projects via the sale of CER are not a determining factor for their implementation.



*The goal must be to emit less CO<sub>2</sub> - photo: Daniel Grothe/Flickr.com*

A study carried out by the Ökoinstitut reaches a more differentiated result. This study finds that it is very unlikely that projects for renewable energies and energy-efficient lighting are additional. For projects concerned with capturing industrial exhaust gases or methane, e.g. from landfill sites, on the other hand, the likelihood that they would not have happened without CER was quite high. These products mainly produced costs and the only revenue they generated was via CER.

However, the study also mentions the false incentives that this can cause. This is because, the more industrial exhaust gases produced and then captured, the higher the CER payments (Cames, Harthan, Füssler et al 2016: 13). That is why, at the European level, these projects are no longer admissible under the CDM (European Commission 2011: no p.).

It can be noted for the discussion about the additionality of green bonds that there is a clear definition within the framework of CDM measures for additionality when it comes to funding climate projects. However, in the context of Certified Emission Reduction Credits, it is difficult or impossible to prove the additionality of most projects.

### Clean Development Mechanism not a suitable yardstick

It must however be said that there are essential differences between green bonds and the Clean Development Mechanism. For example, as already described,

depending on the CO<sub>2</sub> price, the CER only provide a portion of the project funding, whilst green bonds fund whole projects and so their profitability as a whole must be considered. Secondly, there is a big difference in the volume of funding. Whereas, because of the continuing very low CO<sub>2</sub> price at the end of 2017, the volume of the CDM was only 33 billion US dollars, 343 billion US dollars in capital was generated with green bonds up to that point, that is more than ten times as much (Carbon Pulse 2018: no p.). It is conceivable that, because of the larger volume of capital and strong growth in recent years, green bonds can be additional in a different way to CDM projects.

In view of these essential differences between supporting a project through the CDM and funding a project via green bonds, it would be better not to continue using the CDM definition for assessing the additionality of green bonds. Other yardsticks should be sought and tested in order to detect and measure the role that green bonds have in procuring additional capital for sustainable development. In the following, three alternative ways of defining and measuring the additionality of green bonds and the first results of using these methods are presented. First, we will look at the possible financial advantage for issuers if they seek to raise capital using green bonds. Second, the sustainable orientation of issuers of green bonds overall will be considered. Third, we will investigate whether green bonds are additional in the sense of the OECD definition for development banks (DAC definition).

## 5.2 Lower capital costs thanks to green bonds

A few studies look at whether issuing green bonds is associated with lower capital costs. The findings of the study carried out by David Zerbib comparing 69 green bonds with comparable conventional bonds are used here as an example. The study comes to the conclusion that green bonds are on average two basis points, i.e. 0.02% and sometimes up to 0.08%, cheaper than comparable conventional bonds. It is interesting to note that this effect is stronger in the case of green bonds that are less attractive because of being riskier – having a financial rating below the top rating of AAA – and a lower issued amount (cf. Zerbib 2017: 31).<sup>7</sup>

This finding is confirmed by market actors. Although it is usual to offer bonds at slightly above the existing yield curve of an issuer in order to attract investors who can then record a positive premium when trading starts, many green bond issuers refrained from adding this reserve in their initial offering. Apparently, this sometimes works but not always.<sup>8</sup>

This means a slight price advantage can be seen for green bonds. However, if the advantage remains slight, then green bonds do not make any meaningful contribution towards making additional capital available for environmental projects thanks to lower capital costs.

7 "the average green bond premium turns out to be significantly negative and equal to -8 bps in the whole sample of Investment Grade Bonds, -5 bps and -2 bps in the US-D and the EUR bonds with an issued amount greater than USD 100 million, respectively, and -9 bps and -4 bps in the subsamples of below-AAA US-D and EUR bonds, respectively." Source: Zerbib page 31 "the riskier a bond or the lower the issued amount, the greater the negative premium will be" source: Zerbib page 31.

8 Statement made during an interview with an expert.

## 5.3 Green bonds as a driver for pushing companies in a new direction?

Another approach to investigating the additionality of green bonds is to examine to what extent issuers of green bonds shift to a more sustainable path overall. A study carried out by the 2° Investing Initiative looks at this question for global utilities. It compares 20 issuers of green bonds with 179 issuers of non-green bonds. The authors of the study specifically compare power stations planned by the two groups that are to be built between 2017 and 2022. The findings show that issuers of green bonds in 2017 have capacities of wind and solar energy, but also of coal-based power, that are similar to those of issuers of non-green bonds.

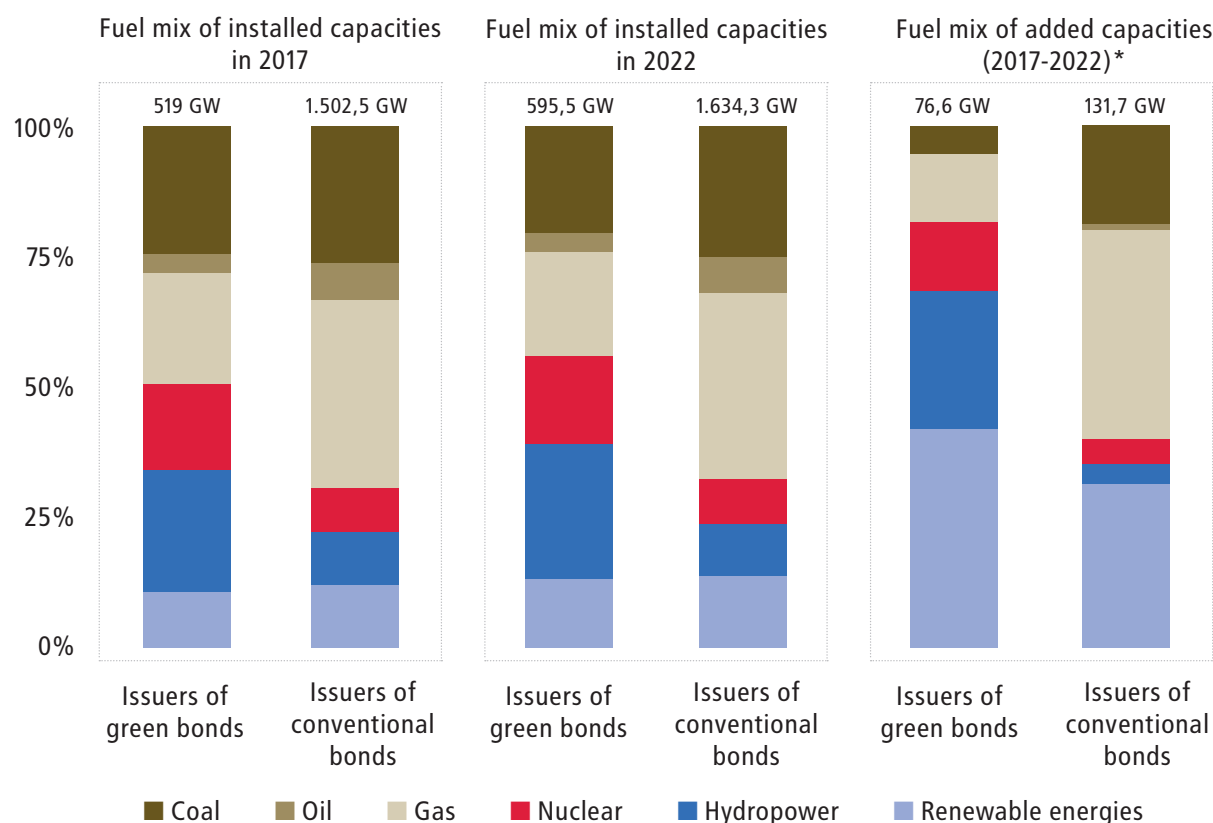


However, the first group generates significantly less electricity from gas, whilst its share of electricity generated from hydropower and nuclear energy is significantly higher than in the case of issuers of non-green bonds. Up to 2022, issuers of green bonds plan additional capacities in the hydroelectric power, wind and solar energy sectors, as well as in nuclear energy. A few issuers of green bonds plan, in addition, to expand their coal-based capacities. The most obvious difference between this group and issuers of non-green bonds is that the latter plan significantly less hydroelectric power and nuclear power projects, but are going to continue putting more focus on gas-fired power stations (2° Investing Initiative 2018: 21).

However, issuers of non-green bonds also plan to expand wind and solar power significantly, but investors cannot decide when they invest with issuers of non-green bonds whether to invest specifically in the sustainable activities that the provider is engaged in.

*A study looks at the sustainability orientation of issuers of green bonds and issuers of non-green bonds - photo: Asian Development Bank/Flickr.com*

**Fig. 4: Fuel mix of issuers in the energy sector**



Source: 2° Investing Initiative 2018

\*73 issuers had no added capacities

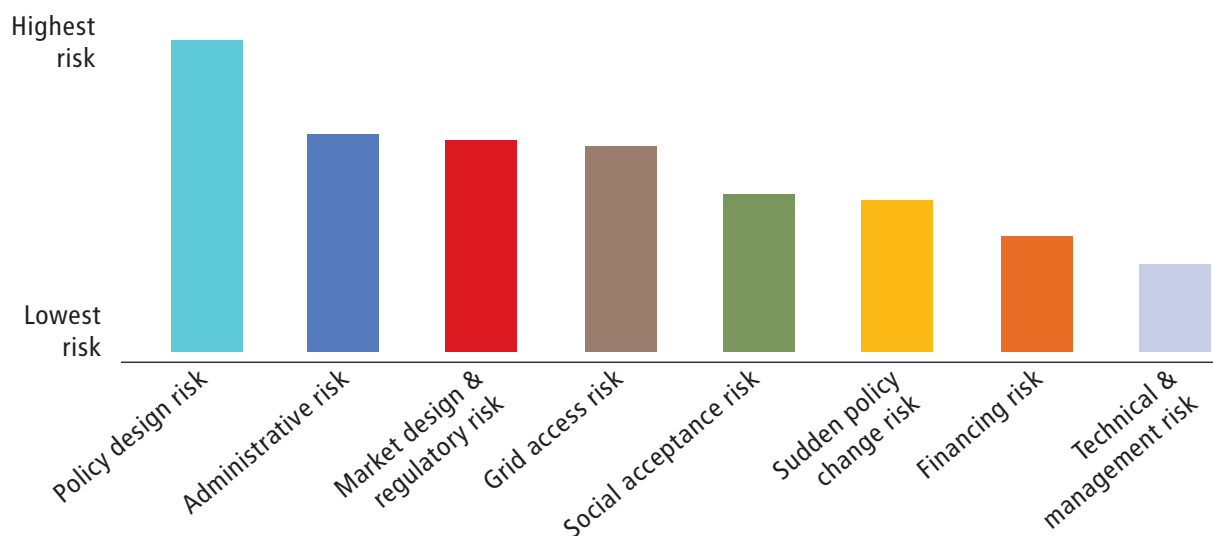


### Side bar: Obstacles to implementing environmental projects

In the discussion about green bonds it is usually assumed that the financing of environmental projects is the biggest obstacle to implementing them. This is true for renewable energy projects in particular in the sense that the installation of the plant entails high start-up costs that are only recouped over a period of years by selling the power generated. In this situation the capital costs are a significant cost factor for the project and significantly influence the electricity price and thus also the profitability of the project. However, the willingness to take on this risk that lasts over a period of years does not just depend on the availability of capital. It also depends on the long-term guarantee of being able to feed renewable power into the grid at an attractive price.

A study commissioned by the EU on the obstacles to implementing onshore wind parks comes to the conclusion that investors and project developers see the reliability of policymaking as the biggest risk when planning such projects. For the most part, European project developers see the design and enhancing the reliability of government strategies for renewable energies, regulating the feed-in options in the case of independent suppliers of electricity, administrative rules, applying for approval and the time it takes for applications to be processed, unfettered access to the grid and social acceptance as more of a headache than the question of whether or not they will get enough capital at an acceptable price for their planned projects.

**Fig. 5: Which risk category do you consider most important? Average ranking of risks across 24 EU member states survey completed by over 80 financial experts from 26 EU countries in 2014.**



Source: DiaCore 2016: 31

An issuer of green bonds that does not make a comprehensive change of course will bundle its green activities in green bonds and finance its non-sustainable activities via conventional bonds. They will automatically be less sustainable. For the energy providers investigated this meant using conventional bonds from issuers of green bonds for oil-fired, nuclear and large-scale hydroelectric power stations.

At the issuer level, therefore, green bonds are accompanied by slightly increased investments in renewable

energies. However, there is no evidence of a radical shift to renewable energies and the exclusion of fossil fuels and nuclear power.

The conclusion of both these studies, which look at the additionality of green bonds from two very different perspectives, is that, in the given circumstances, they do indeed have the potential to initiate a slight shift towards more investment in environmental projects. However, this shift is still a long way from being big enough to satisfy the huge demand for capital.



But this order of risks is a European average. In some countries the financing risks and the capital costs play a greater role for the implementation of projects than in others. In southern European countries, for example, where the euro crisis led to a certain reticence among lenders, the capital costs are far higher than in countries like Belgium, France or the Netherlands. In countries like Greece, Portugal and Romania, wind park project developers put financing risks in second or third place on the list of problems that they are concerned about. How far green bonds contribute to easing the financing problems in these countries is analysed below.

Capital costs and thus potentially green bonds as well therefore play a crucial role in realising renewable energy projects. In most European countries, however, the simple availability of capital at acceptable conditions is less of problem than the regulatory situation.

In the study, however, it also becomes clear that a high level of competition to finance renewable energy projects can be a great help in facilitating their implementation. This assumes that the banking sector is well informed about such projects.

Here Germany is cited as an example. On the one hand, the dependable general frame conditions over the last several years mean relatively low costs. However, actors also mention the strong competition among German banks to provide the financing for wind power projects as a reason for the low capital costs (DiaCore 2016: 40).

It is possible that green bonds contribute towards creating an environment such as the one described here for Germany and hence, via soft factors like expanding banks' knowledge, strengthen the financing of environmental projects.



*Aerial view of the offshore wind park in the eastern North Sea - photo: RWE Innogy/Flickr.com*

## 5.4 Additionality in the sense of the definition used by the OECD Development Assistance Committee

A further definition of additionality that is relevant here was developed by the Development Assistance Committee (DAC) for national and multilateral development banks. As public sector institutions, these banks must consider both economic viability and their goal of reducing poverty and protecting the environment. Without the obligation for private sector projects to be funded „additionally“, there is the danger that development banks with their more favourable refinancing options will squeeze out private financing institutions. According to the definition, when development banks support the private sector in a country, the following conditions for granting such a loan must be met: the

loans must be additional, either financially or operationally and institutionally.



*Development banks must aspire to economic viability as well as to the goal of reducing poverty and protecting the environment - photo: Dana Smillie / World Bank*

Financial additionality exists for them because of the “high initial cost (...), or untested technology, or – although the project is considered commercially viable, the political risks in the country deter private investors.” (DAC 2016: 4).

“Operational and institutional additionality” means that, because of the participation of a development bank in the financing, the development, environmental or social goals of the bank will be better realised than they would have been without the bank’s participation (DAC 2016: 4). This last form of additionality cannot be applied to green bonds since the projects are only identified as compliant after the fact. This means that there is no possibility as yet to strengthen environmental or social aspects in individual projects or businesses via green bonds. This understanding of additionality is therefore not discussed further in the present study. However, the question of the extent to which green bonds can be financially additional in the sense of the DAC definition is examined.

### 5.4.1 Green bonds – investments in innovations?

An examination of whether green bonds are financially additional in the sense of the DAC definition will be carried out in two steps. First the additionality in the sense of financing projects with “high initial cost”, or higher risk due to “untested technology” will be considered (DAC 2016: 4). In a second step the additionality of green bonds in the sense of “geographical and political risks” will be examined (DAC 2016: 4). Both examinations can only be carried out on the basis of the incomplete data available on green bonds. For example, documentation regarding the volume of innovative technologies is just as incomplete as data about the geographical use of green bonds funding. However, there is enough information to carry out a meaningful initial investigation. It is important that this analysis must be limited to the private issuers of green bonds. Development banks and public issuers have the task of financing projects that are important from the perspective of the common good and that the market eschews, regardless of whether green bonds are issued. Therefore they must per se be additional in the sense of the DAC definition.

### Financial additionality is not everything

Besides financial additionality, there are other factors that are influenced by the issuing of green bonds. Issuers are always pointing out that the financial advantage of issuing a green bond is limited, but that green bonds expand their investor base. Issuing a green bond can mean that sustainable investors take note of an issuer and that the green label is a way for issuers to find new investors. What is more, sustainable investors are seen as more long-term oriented, which makes them attractive for issuers.

Secondly, issuing a green bond goes hand in hand with comprehensive documentation of the sustainability of the projects financed. The finance department has to think hard about sustainability and links to the corporate social responsibility department are thus strengthened. Companies therefore talk about comprehensive lessons learned once they have accomplished their first green bond issue. The impacts of these lessons learned can directly affect the company’s willingness to finance sustainable projects and, in a long-term best-case scenario, also positively impact on capital costs. If a bank knows the special problems of wind or solar park projects, for example, it is able to assess requests for funding from these quarters and distinguish

between promising and less promising proposals. If this know-how spreads across the banking landscape, then it can mean greater competition and thus lower capital costs for these projects.



*Issuing green bonds goes hand in hand with comprehensive documentation of the sustainability of the projects financed - photo: Asian Development Bank/Flickr.com*

## Innovative projects with high initial costs

The analysis of how many green bonds projects with high initial costs, high risks or untested technology are financed relies on the transparency of the issuers. Certainly, it can be assumed that issuers who at least disclose some examples of their green bonds projects report on their innovative projects, since this helps to improve their image. However, there are very few innovations among the projects by private issuers considered in this study. That is not unexpected. As outlined above, generally speaking, bonds are rarely used for the initial financing of risky projects.

Innovations can be found among the projects listed by the company Apple, which uses its green bonds for research and development among other things. A recycling robot for mobile phones is being developed and new, more environmentally friendly materials are also being tested. The Taiwanese semi-conductor manufacturer Advanced Semiconductor Engineering (ASE) states that it is carrying out “green product development” with its green bond funding. In both cases “use of proceeds” green bonds are being used where the company as a whole stands for the servicing of the bonds and the redemption of the bond is also possible via non-green projects of the company.

The financing of innovations via green bonds is thus still the exception rather than the rule. Significant volumes of funding raised via this instrument are certainly not being directed towards innovations.

Quantitative proof of the low level of financing for innovative technologies can be found in the project category “renewable energies”. Here there are technologies with varying degrees of maturity and initial costs. Using the data available on individual technologies, it is possible to take a closer look at how much funding for innovative technologies with higher initial costs that are relatively untested comes from green bonds. Because of the lack of transparency on the part of most issuers, the comparison can only be made based on the number of projects and not based on investment volumes.

**Table 6: Number of green bonds projects per type of technology**

### Initial costs for renewable energies

Type of energy	US dollars/kW	Number of projects funded via green bonds from private issuers
Wind parks (onshore)	1,200-2,000	267
Solar (photovoltaics)	1,200-2,200	90
Hydroelectric power (including dam renovations)	922-1,976	51
Bioenergy and biomass	500-8,000	35
Wind parks (offshore)	2,200-5,000	24
Geothermal	560-5,000	10
Solar power installations on private buildings	1.050-4,550	9
Solar thermal power stations	2.550-11,265	1

*Source: own calculations using data from the International Renewable Energy Agency*

It would appear that yields from green bonds are used far more often in projects involving comparatively low costs and using tried and tested technologies than in projects involving high initial costs and/or technologies that are not so tried and tested. This comparison does not therefore show that technology with high initial costs and untested technology are particularly likely to be financed via privately issued green bonds. This is most obvious in the case of solar thermal power stations.

It can therefore be said that there is no evidence in this sector of green bonds being additional in the sense of the DAC definition „high initial costs“, or high risks from „untested technology“.



### Innovative projects by „pure players“

The „pure players“ among the issuers of green bonds are responsible for implementing an especially large number of projects with a high potential for contributing to climate and environmental protection. Their issues account for about 5% of all green bonds issued (CBI 2017a: 19). The pure players are made up of companies whose entire business revolves around environmental projects. If they issue a bond, then it is „green“ with or without the actual label. If the bond is issued under the green label then it means that it has undergone the pertinent verification procedures and there is mostly transparency with regard to the projects financed via the green bond. This group of issuers includes companies that build wind and solar parks in Europe and the US and project developers for such parks. But companies from India and China that can be described as pure players have also issued green bonds in the past. They include, for example, Greenko, a company that finances wind, solar and small-scale hydroelectric plants in India, or Jain Irrigation, which offers drip irrigation and photovoltaic systems for Indian small farmers.

The company LEVC (formerly the London Taxi Company), which is part of the Chinese Geely Holding Group, is using capital raised from a green bond to build a factory where electric taxis will be developed and manufactured.



Meanwhile, the company Copower is using a green bond to realise a sheaf of small projects that involve making buildings more energy efficient and equipping them with solar panels.

With regard to the additionality of these green bonds issued by pure players, which are issued by a minority of about 11% of the issuers of green bonds, the question to be asked is whether this instrument offers any advantages for the company when it comes to raising capital. If these issuers have access to more capital or capital at better terms with a green bond, then green bonds are additional for them. However, so far, no studies have looked at this sub-group of issuers of green bonds.

### 5.4.2 Green bonds – geographical and political risks

Apart from being additional when there are high risks due to using untested technologies, a project is said to be additional according to the DAC definition when higher geographical or political risks are involved. This form of additionality applies especially for projects in countries in the global South. However, major differences in the financing costs and risks for renewable energies can also be observed in Europe. These differences can offer an indication as to the role played by green bonds.

### 5.4.3 Green Bonds in Europe

In global terms, EU member states are considered to be countries with comparatively low financing costs and risks. As described above, there are however major differences, e.g. between the countries of southern Europe, which were hit by the euro crisis, and northern European countries. There are countries with moder-

ate financing costs such as Germany and the Netherlands on the one hand and then there are countries like Portugal and Spain where, despite the very favourable geographical conditions for wind and solar power, significantly higher financing costs are quoted.

With regard to the additionality of green bonds, the question to be asked is what particular contribution they can make towards easing the situation in these countries where financing is tight. To answer this question, in the following the costs for onshore wind parks in the individual European countries will be set against the proportion of green bonds funding that these countries have received in the renewable energies sector. Furthermore, the findings will be presented of a survey that asked experts to say in which European countries the financing risk is cited in first, second or third place. This comparison will help to show whether green bonds funding is used more in places where there is a higher financing risk or higher financing costs and if there could therefore be additionality in the sense of being used in the case of higher geographical risks.

**Table 7: Capital costs for renewable energies and share of green bonds funding**

Country	Average capital costs <sup>9</sup> for onshore wind energy in EU countries as a %-age of the investment volume	Share of green bonds funding from private issuers flowing into renewable projects in the EU (per country as a %-age of total private green bonds funding)
Germany	5.6	36.96
France	6.1	12.81
Belgium	6.4	0.84
Denmark	6.4	0.06
Netherlands	6.4	1.90
Austria	6.5	1.47
Great Britain	6.5	10.29
Finland	6.7	0.10
Sweden	6.7	4.39
Malta	7.1	0
Czech Republic	7.2	0.11
Italy	7.7	3.91
Slovakia	8.1	0
Spain	8.1	23.70
Poland	8.7	0.22
Estonia	9	0
Ireland	9	1.06
Latvia**	9.3	0.01
Lithuania	9.7	1.28
Croatia	9.7	0.02
Bulgaria	9.8	0
Portugal*	10.2	0.56
Slovenia	11	0.06
Romania**	11.1	0.18
Hungary	11.3	0
Cyprus***	12.3	0
Greece**	13.5	0.04
Luxembourg	no data	0

\*\*\* Financing risks named in first place

\*\* Financing risks named in second place

\* Financing risks named in third place

No star: financing risks not listed among the top three risks

Source: DiaCore 2016: 26 and 32 and own calculations for green bonds

This comparison does not give any indication that there is a correlation between capital costs and green bond investments in EU countries. It is true that the very high amounts invested in renewable energies using green bonds in France, Germany and Great Britain – all countries with relatively low capital costs – do suggest a link.

However, this is not borne out by the findings in Spain, Belgium and Denmark. Spain has relatively high capital costs of 8.1% and yet is in second place for investments from green bonds. Belgium and Denmark have low capital costs. Yet only 0.84% and 0.06% of green bonds funding respectively is invested in renewable energies in these countries. Thus it cannot simply be maintained that the lower the capital costs the higher the proportion of investments.

The example of Spain is particularly interesting for a study of the additionality of green bonds. Here the major share of the private green bonds funding, which is relatively high compared with other European countries, comes from the company Iberdrola. Iberdrola is an electricity supplier that has shifted away from fossil fuels and nuclear power in recent years and is obviously managing to use green bonds to expand its investor base, in order to finance its sustainable energy projects on slightly more favourable terms.



Iberdrola's Dry Lake Wind 2 wind power plant in Arizona, USA - photo: Stephen Mellentine/ Flickr.com

<sup>9</sup> Weighted average capital costs (WACC) were used here.

It is however clear that, in countries with high financial risks (as opposed to high financial costs), such as Greece and Portugal, very little is invested from private green bonds funding. Here green bonds are not a counterweight to the existing trend.

Capital costs and using green bonds capital seem to be independent of one another. Even if a slight preference can be seen for countries with low capital costs, the example of Spain shows that private actors also use green bonds specifically for reorienting in environments where financial costs are high. However, the data do not depict additional financing through green bonds funding in countries with a higher financial risk.

#### 5.4.4 Green bonds in countries of the global South

Whilst access to capital is, with a very few exceptions, not an issue in Europe, in countries of the global South, geographical and political risks often impede access to capital. This means that green bonds used to finance environmental projects in these countries would have a considerably higher chance of counting as additional financing in the sense of the DAC definition than green bonds for financing projects in countries of the global North.

In the following, this question will be examined using data on investments funded with corporate green bonds. The total volume of corporate green bonds funding will be set against the total volume of capital raised through corporate bonds. The result will show

the share of green bonds as a percentage of corporate bonds in each country.<sup>10</sup> If groups of countries with high financial ratings are compared with groups of countries with low ratings using these data, then it can be seen whether for each financial rating green bonds have an equal, a lower or a higher share in flows from corporate bonds. This will indicate whether green bonds are used more in countries with higher geographical and political risk than in countries with a low country risk and thus whether they contribute to additional financing in those countries.

The countries are grouped using the Euler Hermes rating. This rating assesses the security of investments in companies in a country and thus provides a suitable basis for this comparison.

The data show that, in countries with a high Euler Hermes rating of AA or A, 108 billion US dollars in green bonds funding is invested by corporate issuers. By comparison, in countries with a rating of B-BB, 29 billion US dollars is invested. In countries with an Euler Hermes rating of C or D, only 425 million US dollars of corporate green bonds funding is invested.

If these figures for green bonds are compared with the total amount of all private debt securities listed in the statistics of the Bank for International Settlements (BIS), then it can be seen that, in countries with a B-BB rating, the share of privately issued green bonds is 0.25%, which is almost exactly the same as in countries with a rating of A or AA (0.26%).

**Table 8: Share of corporate green bonds funding as a percentage of all funding from corporate bonds based on the Euler Hermes risk groups**

Euler-Hermes country risk	Volume of green bond issues in billions of US dollars	All privately issued fixed-interest bonds (total sum outstanding at the end of December 2017 in billions of US dollars)	Share of green bonds as a %-age of privately issued fixed-interest debt securities
AA-A	113.29	42,988	0.26
BB-B	29.02	11,541	0.25
C-D	0.43	393	0.11

Source: own calculations and BIS – <http://stats.bis.org/statx/srs/table/c1>

<sup>10</sup> The total volume of all outstanding privately issued bonds per country at the end of 2017 (source BIS) is compared with the total volume of all flows of capital into the country from privately issued green bonds up to the end of 2017 (source CBI)



By contrast, in countries with a very high credit risk rating (C-D), the share of green bonds funding is 0.11%, which is less than half the share of green bonds funding in countries with a rating of AA to B. In other words, whilst the share of green bonds with a low or a medium risk is more or less the same, countries with a high risk receive a negligible share of private green bonds funding. This reflects the very low flows overall from green bonds into low-income countries.

*Overall, flows of funding from green bonds into low-income countries are very small - photo: Peter Kapuscinski/World Bank/Flickr.com*



### Financing using green bonds funding in low-income countries

The documentation available on green bonds shows that, altogether, 11 out of 33 low-income countries receive green bonds funding. The countries receiving such funding are Democratic Republic of Congo, Ethiopia, Guinea, Liberia, Mali, Mozambique, Nepal, Rwanda, Tajikistan, Tanzania and Uganda. Of the total of 2,827 disclosed projects, 25 are financed in these countries. Even development banks, which could prove the necessary additionality via investment in these countries, only supported 22 projects in low-income countries using their green bonds capital. Private issuers only have three projects in these countries. First, the Norwegian solar company Scatec is financing solar plants in Mali and Mozambique via its green bond. Furthermore, the Indian company Jain Irrigation is engaged in a public sector South-South cooperation project for drip irrigation in Rwanda.

**Table 9: Green bonds projects in low-income countries**

Issuing group	Number of projects	Investment volume
Development banks:	22	214,26 million US dollars
Private companies:	3	not disclosed

Green bonds are underrepresented both in European countries with a high financial risk and in countries of the global South with a C-D Euler Hermes rating. In these countries with weak or very weak ratings, green bonds do not appear to be an effective instrument. Emerging markets with better developed capital markets and lower risk have a much better chance of using the green bonds instrument and, as the analysis of individual countries shows, accessing additional financing through this instrument.

This means that there is only a hint of additionality in the sense of financing in countries with high geographical and political risk (DAC definition).

## Green bonds are additional in some countries of the global South

**Table 10: Share of green bonds funding as a percentage of all funding from privately issued bonds per country**

Country	Share of green bonds as a percentage of privately issued fixed-interest securities (outstanding total sum at the end of December 2017)	Euler Hermes ranking
India	13.056	B
Morocco	7.433	B
New Zealand	5.668	AA
Mexico	1.601	BB
Latvia	1.249	BB
Sweden	1.115	AA
Colombia	0.982	BB
Philippines	0.842	B
South Africa	0.637	B
Poland	0.580	BB
Slovenia	0.567	BB
Spain	0.563	A
Brazil	0.510	B
Peru	0.447	BB
Germany	0.403	AA
Hong Kong	0.303	B
Chile	0.297	A
France	0.289	AA
Thailand	0.200	B
Taiwan	0.195	A
Australia	0.187	AA
Canada	0.180	AA
Turkey	0.177	C
Malaysia	0.169	BB
Norway	0.168	AA
Italy	0.139	A
USA	0.130	AA
Japan	0.126	A
Singapore	0.122	AA
Austria	0.114	AA
Portugal	0.092	BB
Czech Republic	0.089	A
Great Britain	0.079	AA
Netherlands	0.071	AA
Belgium	0.069	AA
China	0.064	B
Switzerland	0.052	AA
South Korea	0.041	BB
Ireland	0.023	A
Russia	0.012	C
Finland	0.009	AA
Luxembourg	0.003	AA
Denmark	0.001	A

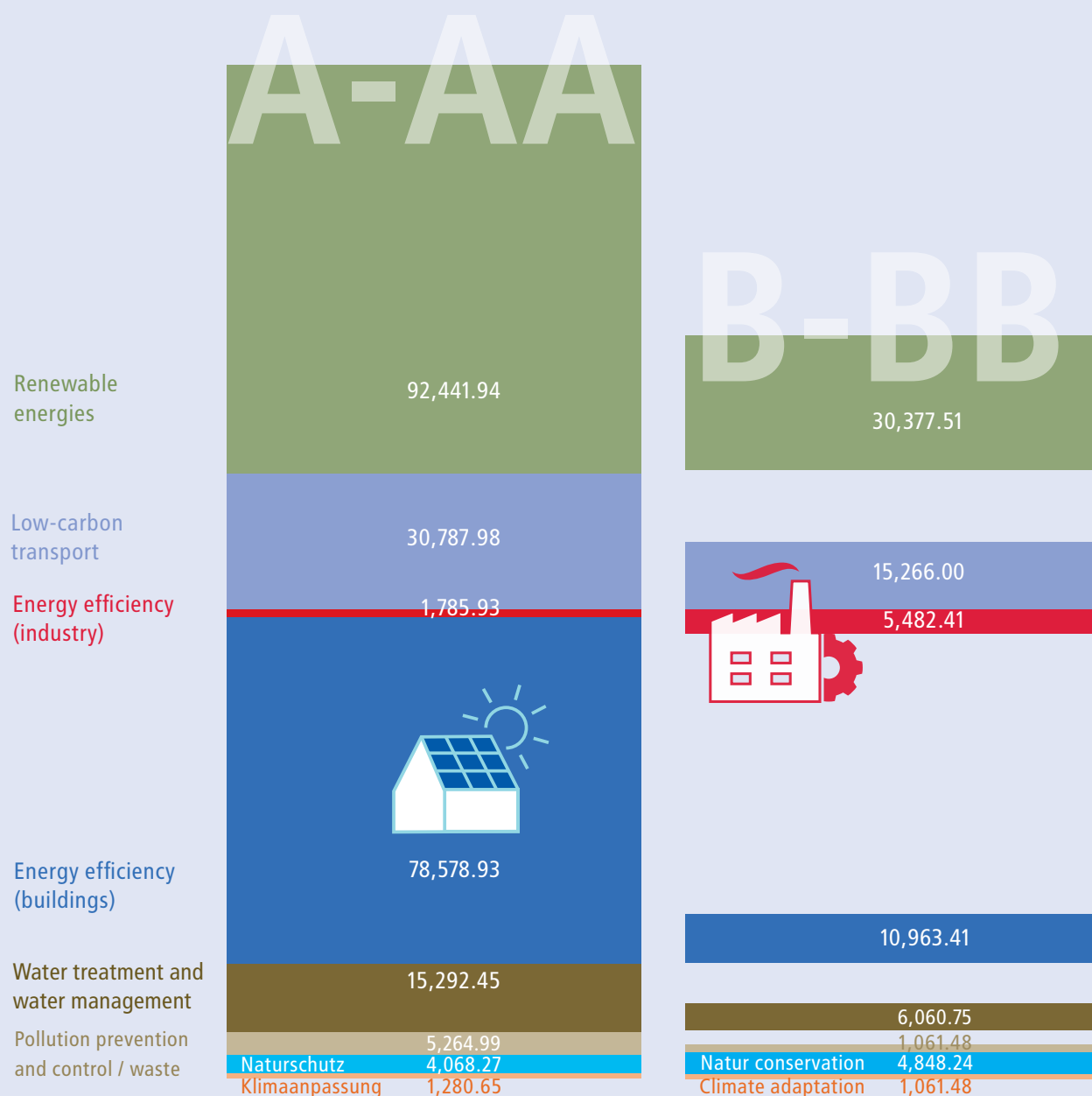
Table 10 shows that, among countries with a well-above-average share of green bonds as a percentage of privately issued fixed-interest securities, those with a medium financial risk make up the majority. Of the seven countries where green bonds funding accounts for an above-average share of private bonds, five have a rating worse than A and three of them are from the group of middle-income countries. There are even two countries here (India and Morocco) that are from the lower-middle-income group. In India, Morocco, Mexico, the Philippines and Peru, thanks to green bonds, a far bigger share of private funding goes to finance environmental projects than the average invested in such projects in high-income countries. In all these countries it is individual private actors who use the instrument in order to finance special environmental projects and who push up the share of such projects. India and Morocco are special cases, where more than 7% of corporate fixed-interest debt securities are green bonds. The special situation in these two countries will be analysed in case studies.

China is a very important issuer of green bonds, but is not included here because only corporate issuers are being considered. In China, by contrast, the vast majority of green bond issues are in the public sector. In addition, in China the share of green bonds compared with overall corporate issuers is still relatively small.

Source: own calculations using data from BIS, CBI Bond Data list, <http://stats.bis.org/statx/srs/table/c1>

**Fig. 6: Where is green bonds funding invested?**

Use of green bonds funding from private and public issuers / comparing countries with A-AA and B-BB Euler Hermes ratings



Source: CBI green bond data up to the end of 2017, own research and calculations based on issuers' documentation, all figures based on information available online up to the end of 2017

If you compare the use of all green bonds funding, from corporate and from state-issued bonds, in countries with a low financing risk with the use of such funding in countries with higher risk, then it becomes clear that there are significant differences. These differences are particularly noticeable in the case of energy efficiency in buildings and energy efficiency in industrial manufacturing. In countries of the global North, financing

energy efficient buildings is the second most important use of green bonds funding, whilst in the global South this category is in a distant third place. By contrast, issuers in the global South make significantly more use of green bonds capital in order to make industrial processes more energy efficient, whilst in the North this category is becoming less and less important.



#### 5.4.4.1 Green bonds in Morocco

To understand the relatively high share of green bonds funding from corporate and state-issued bonds in Morocco, it is necessary to look at the Moroccan government's energy policy. Morocco imports 95% of its energy in the form of fossil fuels and subsidises the cost of this energy on the domestic market. At the same time, the country is in a very good position for using renewable energies such as wind, solar and hydroelectric power. Morocco therefore plans to generate 42% of its energy from renewables by 2020. Since Morocco must supply electricity for its growing industrial sector, the country is also counting for the provision of the basic energy load on building solar thermal plants, an energy form that is currently expensive, even set against the cost of subsidising oil imports (GCBP 2014: 1).

This plan is being supported by the Moroccan government and multilateral banks such as the AfDB, EIB and the World Bank, which are refinancing a portion of the Moroccan projects via green bonds. In addition, two local private banks have issued green bonds, whose yields are supporting the establishment of renewable energies in Morocco. Another national issuer is the Moroccan Agency for Solar Energy (MASEN).



Morocco plans to generate almost half its energy from renewables by 2020 - photo: Pieter Edelmann/Flickr.com

**Table 11: Green bonds in Morocco**

Status	Issuer	Volume in millions of US dollars	Use
private	Banque Marocaine du Commerce Extérieur (BMCE)	55	renewable energies
private	Banque Centrale Populaire	168	renewable energies
state	MASEN*	125	renewable energies
multilateral	African Development Bank (AfDB)	528	renewable energies/water
multilateral	European Investment Bank (EIB)	210	renewable energies
multilateral	European Bank for Reconstruction and Development (EBRD)	121	incl. renewable energies
multilateral	World Bank	728	pollution prevention and control, renewables, nature conservation
<b>total</b>		<b>1,935</b>	

\*MASEN is a private sector entity funded by the state that is responsible for implementing the plan for expanding renewable energies in Morocco.

Source: CBI, websites of the issuers

In the case of these bonds, most of the investors can be traced back. The Banque Centrale Populaire's issue was bought by the World Bank subsidiary IFC and a subsidiary of the French development bank that serves the private sector in particular.

The much smaller green bond (just under 55 million US dollars) issued by the stock market listed bank BMCE was not listed on a stock market and was therefore probably sold to the bank's own Moroccan customers.

The MASEN green bond was bought by four state or peri-statal Moroccan investors, including a local reinsurer and a pensions fund.

This means that there are virtually no private investors from the global North involved in financing the expansion of renewable energies via green bonds in Morocco. There is, however, considerable engagement by local institutional investors in these innovations.

However, by far the biggest share of the expansion of renewable energies in Morocco financed via green bonds comes from development banks, which refinance their investments on the international capital markets, especially from the AfDB.

This means that, in Morocco, green bonds are a vehicle for implementing the government's plan to expand renewable energies. This vehicle is used to mobilise both public funding from development banks and, to a smaller extent, investment from private local capital. The government's plan and green bonds complement one another and together they lead to additionality. The plan creates a reliable environment for investment and the green bonds signal to investors that their money will be used to invest in renewable energies within this plan. This makes these green bonds attractive for international development banks and for local investors.

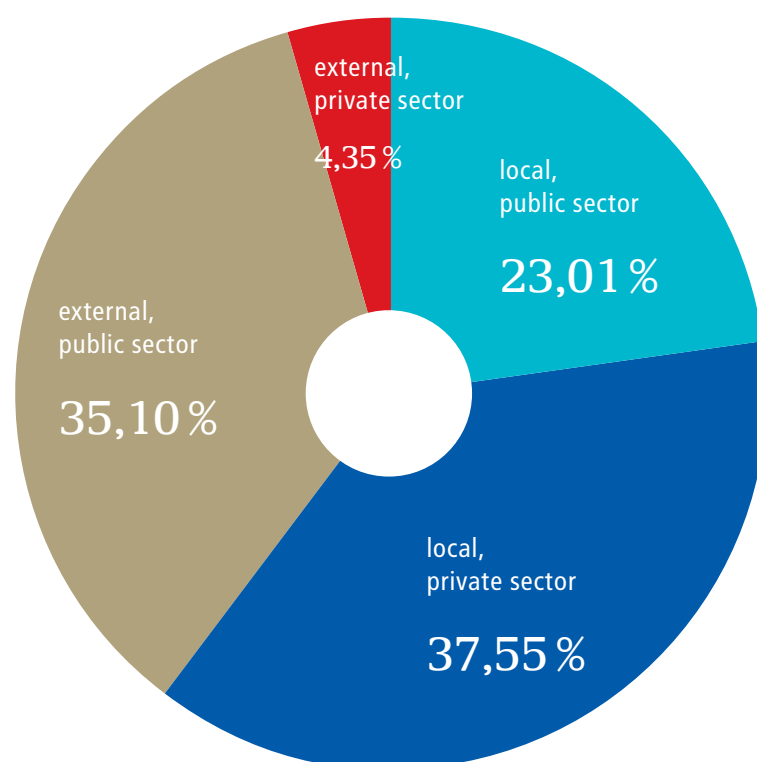
#### 5.4.4.2 Green bonds in India

Since 1992, India has had a Ministry of New and Renewable Energy (MNRE) and has been setting itself more and more ambitious goals each year for scaling up capacities for solar, wind and hydroelectric power. As in Morocco, a driving force behind the planned expansion is, in addition to climate change, the country's dependence on oil imports. In 2017, the Securities and Exchange Board of India issued a guideline for green bonds which says that the projects financed via green bonds must be disclosed (SEBI 2017: 3). Since 2015, private and public issuers have traded green bonds on national and international financial markets. India has flows of more than 10 billion US dollars from green bonds, a volume surpassed among emerging markets only by China and higher than in Spain and Australia. Furthermore, the role of private Indian issuers is significant. They account for more than 37% of green bonds cash in India.



*Solar thermal power station in Morocco - photo: Dana Smillie/World Bank/ Flickr.com*

**Fig. 7: Distribution of green bonds funding in India by issuer group**



*Source: CBI, homepage of the issuers and own calculation*

If you look at the bonds issued by local private sector issuers up to the end of 2017, the following picture emerges:

**Table 12: Bonds issued by local private sector issuers up to the end of 2017**

Country of the issuer	Issuer	Currency	Investors	Volume of issue in millions of US dollars
India	L&T Infrastructure Finance Company Ltd., Indian subsidiary of an international conglomerate	IN rupees	International Finance Corporation (IFC), Asian Development Bank (ADB)	104.12
India	Azure Power Energy, Indian solar power company	US dollars	American and international investors	500.00
India	CLP Wind Farms India, Indian subsidiary of a Chinese power utility	IN rupees	Asian investors	94.00
India/ Isle of Man	Greenko, Indian equity investment of a private equity company specialising in sustainable companies	US dollars	40% Asian, 40% American, 20% European investors	1,500.00
India	Hero Future Energies, Indian renewable energies company, partially funded by the IFC	IN rupees	private Indian investors	77.00
India	Jain International Trading, Indian company	US dollars	international investors	200.00
India	Axis Bank, third biggest private bank in India	US dollars	unknown	500.00
India	ReNew Power, Indian renewable energies company	IN rupees	unknown	552.80
India	Yes Bank, fifth biggest private bank in India	IN rupees	24% IFC	209.34
<b>total</b>				<b>3,737.26</b>

Source: CBI, homepages of the issuers

Except for the green bond issued by L&T Infrastructure and some of the Yes Bank bonds, all privately issued Indian green bonds were bought by private investors. The green bonds listed in US dollars in particular were successfully sold on the international markets.

The unusually high share of private issuers of green bonds indicates that impediments to raising capital

from local banks were successfully overcome by issuing green bonds on the international markets. Indian companies from the renewable energies sector themselves see the situation in the same way.

For example, Inderpreet Wadhwa, the founder of the Indian solar company Azure Power, said about a green bond issued by his company:



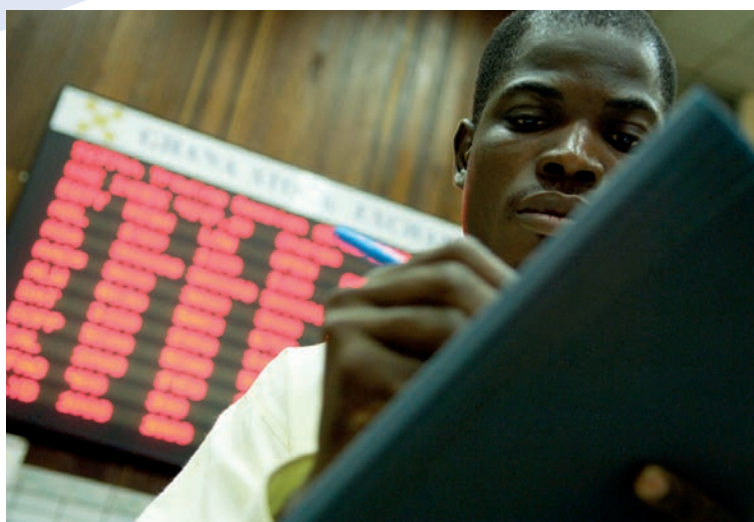
“The energy sector requires a lot of new capital that simply isn’t going to come from traditional banks, investors or project lenders, certainly when you consider the scale of the investment required; within this context, the green bond market has no choice but to flourish – and it will. We are still in the early years, but we expect many more firms to go down this path in the near term.”<sup>10</sup> (Bonds and Loans 2018: no p.).

This quote and the volume of private Indian green bonds funding shown above are not proof of their additionality in the sense of the DAC definition. However, they do illustrate the circumstances under which green bonds could provide additional capital. Private companies in countries of the global South can use this instrument in order to generate capital from institutional investors on international stock markets. This capital would not be forthcoming for their projects from local traditional financiers, or only on far less favourable terms. The green bond label ensures additional attention, which widens the investor base for these issuers and thus facilitates access to capital. Green bonds are a stepping stone for companies in the renewable energies sector on their way to the international financial markets.

International investors are prepared to put their capital into these green bonds. This means that the borrowing costs for a green bond issued in US dollars were 4.7%, whilst the costs for Indian rupees would have been 7.48% (CBI 2017d: 29). However, the issuers are laying themselves open to a considerable exchange risk, because they must redeem the bond in US dollars, whilst the electricity bills for the solar power are paid in Indian rupees. If the rupee falls against the dollar, as has happened in the past, then the capital costs can soar unexpectedly. Ultimately, there is also a risk for the investors here, too, if the currency fluctuations impact negatively on the issuers’ ability to pay. Nevertheless, green bonds are a way to accelerate the expansion of renewable energies in India. In that sense, issuing a green bond does mean additionality for the private energy companies and project developers in India. It is to be hoped that a solution will be found for the considerable exchange risk that comes with these issues.

## 6 Additionality in homeopathic doses

So far, three very different approaches for determining the additionality of green bonds have been described. First, we looked at whether a price advantage on the stock market can be achieved through green bonds. Second, we considered whether they help in getting issuers to make their operations more sustainable. Third, we asked whether green bonds in the sense of the DAC definition lead to more sustainable investment in higher-risk ventures. All three approaches produce a similar result. Green bonds can, in certain circumstances, contribute to a slight degree towards generating additional capital for sustainable projects. Issuers have a small financial advantage when they issue green bonds, especially in situations where the financial data for the bond are somewhat less attractive (slightly higher risk attaching to the issuer or to the country, lower issue volume). Issuers of green bonds tend to invest slightly more in sustainable projects (more specifically in renewable energies). In some countries, where access to local capital for sustainable projects is more difficult, green bonds smooth the path to accessing capital on the international markets.



*In countries where access to capital for sustainable projects is more difficult, green bonds smooth the path to accessing capital on the international markets - photo: World Bank/Flickr.com*

Green bonds from issuers with very good financial ratings and high issue volumes appear to have little impact in countries with low risk, given the very good overall availability of funding.

Green bonds appear to be little suited in situations with high financing risk. This can be seen both in the case of still expensive and high-risk technologies and in the case of countries with a high or very high level of financing risk.

The impact of green bonds is therefore to be found in an area where there is a moderately higher risk, whether it is that the country has a higher risk, that the issuer cannot get an A rating or that the issue volume is below 500 million euros, meaning that there is a danger that the bond will not be traded much on the secondary market.

Given the fact that other more effective instruments such as carbon taxes cannot currently be implemented and there is a high degree of willingness to invest in

green bonds, this is good news. Now, it is important to further expand this approach and make it more effective. Government regulation can help to a great extent here. For example, public sector plans for renewable energies in the EU, in Morocco and in India are the starting point for issuing green bonds. A green bonds regulation that places clear demands on the entire investment plans of the issuer can increase additionality at the level of the issuer. Another way for the public sector to increase the additionality of green bonds is if steps are taken to reduce the obstacles faced by issuers from the global South. Anything that makes the exchange risk for the issuer or the investor more manageable is valuable here.

The need for investment in renewable energies described below shows very clearly how important it is to find ways to increase the use of green bonds significantly, especially in emerging economies, in order to facilitate greater flows of capital.

## 6.1 Need for investment in renewable energies for energy generation

Together with the New Climate Institute and the NGO Germanwatch, the Allianz Climate Solutions has developed a definition for the need and for investment in renewable energies. Need for investment according to the Allianz Climate and Energy Monitor 2017 means the following:

“The investment needs are assessed by a single category assessing the “Future needs for investing in the electricity infrastructure” which in turn is a composite of three indicators: the current and future absolute investment needs in the power sector for building less carbon-intensive and climate-robust energy infrastructure; and needs relative to current consumption, reflecting where development needs dictate need for investing. In addition, a vulnerability indicator is defined to signal relatively greater investment needs into the electricity infrastructure for building resilience from climate change impacts.” (Allianz Climate Solutions GmbH 2017a: 6).

The need for investment in renewable energies thus defined is particularly high in countries with a large

population and high economic growth that are heavily dependent on fossil fuels and large-scale dams for generating electricity. Specifically, in 2016 and 2017, India, South Africa, Brazil and Indonesia were the top four countries in terms of the need for investment in renewable energies within the G20 group.



Friends of the Earth South Africa 2017 day of action for more renewable energies - photo: groundWork/FOEI/ Flickr.com

If a country's need for investment per year is set against total green bonds investments (public and private) in renewable energies up to the end of 2017, the following figures result:

**Table 13: Investment needs and green bonds investments**

G20 ranking for investment needs in 2017	Country	Green bonds investments in renewable energies up to the end of 2017 in millions of US dollars	Investment needs per year up to 2035 in millions of US dollars	Total green bonds funding as a %-age of annual need
1	India	8,161.20	95,000	8.59
2	South Africa	1,822.27	14,000	13.02
3	Brazil	2,080.68	25,000	8.32
4	Indonesia	447.60	13,000	3.44
5	China	10,814.28	208,000	5.20
6	USA	18,165.25	141,000	12.88
7	Russia	191	32,000	0.60
8	France	9,434.80	19,000	49.66
9	Japan	1,955.90	36,000	5.43
10	South Korea	307.84	18,000	1.71
11	Saudi Arabia	0	11,000	0
12	Canada	2,829.78	18,000	15.72
13	Germany	27,714.83	23,000	120.50
14	Great Britain	7,849.26	14,000	56.07
15	Argentina	380	6,000	6.33
16	Italy	2,075.54	13,000	15.97
17	Turkey	1,457.80	9,000	16.20
18	Australia	2,678.8	8,000	33.48
19	Mexico	330.36	9,000	3.67
20	EU	na	na	na

Source: Allianz Climate Solutions GmbH 2017b and own calculations



In Table 13, the annual need for investment in renewable energies calculated up to 2035 is set against the funding raised through green bonds and invested in this sector. It is clear that countries with a very high need for investment are only covering a relatively small amount of this need via green bonds. In the three countries with the highest needs, India, South Africa and Brazil, the ratio of capital from green bonds to the need for investment is significantly worse than in France or Germany, for example. Green bonds in total merely covered about 8% to 13% of the annual need for investment in these countries. The ratio for Indonesia, a country with very high needs and little funding from green bonds, is particularly bad (Indonesia's green bond only issued in early 2018 was not taken into account here).



Even in China, one of the biggest issuers of green bonds, the ratio of 5.2% is low. However, the green bonds capital in China is used more or less equally for low-emissions transport and renewable energies. For this calculation, only the capital used for renewable energies was included.

This comparison shows that it is possible to generate a considerable amount of the necessary investment in renewable energies via green bonds.

However, this is not yet happening in countries with a high or very high need for investment. This is true even though countries like Brazil, India, South Africa and Indonesia in particular are in the category of countries where green bonds can offer a slight financial advantage, as shown above in the case of India and Morocco. All four of these countries have an Euler Hermes rating of B and a relatively well-developed capital market. The potential of green bonds is therefore not being fully used in those very countries that have a high need for investment.

## 6.2 Paths to more additionality

The overall situation as described so far means that green bonds have so far only made a very limited contribution in terms of shifting business towards greater sustainability. Given the dynamic that this instrument is starting to display in the capital markets and the interest shown by investors, that is regrettable. It is not to be expected that self-regulation will cause this situation to change. With the Green Bond Principles and the Climate Bond Certificates, we already have two self-regulation mechanisms that are widely accepted by the markets and that give issuers and investors good guidance by defining what a green bond is and what must be considered when issuing one. Both of them have played a major role in developing the market, but do not have the potential to improve the additionality of green bonds in any meaningful way. That is why state regulation of this segment is necessary in order to strengthen the additionality of green bonds.

Government measures to promote additionality would be all the more effective if they were accompanied by a more far-reaching regulation of the financial market and the real economy. Besides internalising environmental costs, e.g. by putting a price on CO<sub>2</sub> emissions, regulations for the financial market can do a lot to influence the direction of capital flows. These regulations would, for example, include requirements for divestment or minimum quotas with regard to sustainable bonds for investment or insurance companies, or higher capital requirements for banks when they finance projects that have a detrimental impact on the environment like coal mining.

There are two complementary options for a regulation that only covers green bonds based on the ways to create additionality analysed above. One way is to start with the issuers and link the issuing of a green bond with requirements that the issuer must fulfil. The



*Regulations for the financial markets could, for example, include divestment requirements - photo: Joe Brusky/ Flickr.com*

second option is for green bonds themselves to be designed so that they generate additional capital on the capital markets.

### 6.2.1 Green bonds issuers become more sustainable

Issuing a green bond does not cause a company's credit scope to expand. It only means that a green bond is used to finance the "green" projects of a company or a bank that are part of the normal portfolio. The less sustainable projects can be financed simultaneously via conventional bonds. This can mean that, even for companies engaged in activities that are particularly harmful to the environment, financing costs fall if these companies are able to issue green bonds for the projects on their balance sheets that have a "green" label.

More environmental projects only come about when the issuer realigns its entire investment strategy and uses green bonds as a means of acquiring the money for doing this.

As proposed by the 2° Investing Initiative, a regulation could start here. “In other words, the Green Bond+ issuers will not only have to earmark their investment, but also to provide evidence that their overall investment plan is aligned with climate goals.” (2° Investing Initiative 2018: 16). However, objective measurement of whether a company is becoming more sustainable overall is difficult to achieve. There are currently two approaches that can be used for this. First, the ratings of sustainability rating agencies can be used to measure the sustainability of issuers of green bonds and to see if it has improved over the years. This is already happening to a certain extent, since second party opinions partly include the outcome of the sustainability rating of the issuer. A second option would be to use the EU taxonomy for “sustainable finance” which is now being developed and which so far only covers individual activities as the basis for measuring the sustainability of an entire company. With both options, companies whose entire operation is sustainable, such as companies that build wind parks (pure players), would be a special case. They could be excused from having to provide such proof.

Providing proof that the entire company has been realigned could either be obligatory for issuers of green bonds, or they could secure an additional quality label by doing so. Both options have advantages and disadvantages. If providing such proof were to be made obligatory, it is probable that, initially, the volume of green bonds would decrease. However, the quality of the green bonds issued under this stricter framework would be significantly higher. If issuers of green bonds whose entire operation is sustainable receive a special certification, a “green bond+” certification along the lines suggested by the 2° Investing Initiative, the high volume of issues would probably remain. On the other hand, it could be a good thing to have only a few companies striving to achieve this distinction for their bonds at first, if the price is a change in strategy.

Regardless of which path a regulation might take on this point, it would seem to be absolutely vital that the sustainability of the issuer be included. The lack of sustainability on the part of many issuers is a core aspect in the debate about green bonds. Pure players, for exam-

ple, are concerned that it is too easy for non-sustainable issuers to issue green bonds. Market observers also note that the sustainability of the issuer is increasingly playing an important role for investors when judging green bonds (statements made in interviews with experts).

### 6.2.2 More additionality through green asset-backed securities

A second way to generate additional capital for sustainable business via green bonds is by directly connecting projects and investors. This way the limitations that banks are subject to can be circumvented. The payment flows, e.g. for wind or solar plants, are such that it takes a long time before it is possible to start repaying a loan. For such projects, banks must tie up equity capital over many years. Banks in the global South in particular are hard pressed to fund such projects. A green ABS makes it possible for the bank to pass the risk on to investors and be much more quickly in a position to offer new – additional – green loans.

“In this respect green project bonds, covered bonds and perhaps to a lesser extent green ABS are clearly green finance instruments, investors increasing their exposure to these assets simultaneously increase financing flows available for green projects.” (2° Investing Initiative 2018: 9)



*Banks in the global South are often hard stretched to finance wind and solar plants - photo: Jonathan Ernst/World Bank/Flickr.com*

With the help of asset-backed securities (ABS), project developers and banks, too, can implement more new projects more quickly. Generally the loans are transferred shortly after a project is completed. At this point the riskiest phase of the project is already over. A short-term financial involvement in the riskiest phase of the project, which is a phase that they can mostly control, suits project developers. Institutional investors like pension funds and foundations on the other hand are interested in long-term, less risky investments. For institutional investors it could be interesting if project developers transfer projects to them once the construction phase is over. How much securitisation helps more sustainable projects to be carried out depends on the situation on the respective financial markets. If there is lively competition and a wide range of credit financing on offer, as is the case in Europe right now, then the additional effect is only slight. In markets with less credit on offer, where loans are accordingly expensive, securitisation could mean that more credit is offered and interest rates fall. This is the situation that can be found in many countries of the global South, where the need for investment in renewable energies, for example, is especially high.

For all that „green“ asset-backed securities (ABS) offer convincing advantages compared with „use of proceeds“ bonds, there are good reasons why they have not been greatly used until now. ABS have a very poor reputation with many investors, especially with sustainable investors.

### ABS have a poor reputation

The background to the 2008 financial crisis was that banks were increasingly granting mortgages without paying any attention to the creditworthiness of the borrowers. They did this because they were selling these



*The financial crisis in 2008 showed the dangers of asset-backed securities - photo: Alex Proimos/Flickr. com*

loans on and were taking fees from the borrowers and from the investors who invested in the ABS thus created. The result was that banks were granting masses of loans that were essentially worthless because they could not be repaid. Investors had invested billions in these worthless ABS.

When it became known that major financial institutions like Lehman Brothers were invested to a dangerously high degree with borrowed money in these worthless ABS, the financial system, which was built on mutual trust, collapsed with, as we know, disastrous consequences for the global economy.

The question of whether the ABS instrument as such is a source of danger for the financial system and to what degree the lack of regulation of this instrument was responsible for the disaster is hotly disputed to this day (statement from interview with experts). What is certain is that ABS are only acceptable if at all when appropriate safeguards are in place. For example, the banks that grant the initial loans must have a high financial interest themselves in making sure that they also produce long-term yields. This is ensured if they are obliged to keep a considerable portion of the loans on their own books. Experts suggest a share of 20% (Giegold, Philipp, Schick 2016: 73). There must also be easy, safe ways for investors to examine the risks of the loans securitised in an ABS.

Within the EU, the introduction of such rules starting in January 2019 is seen as a first, but in the eyes of many still very inadequate, step in this direction.

### State support for ABS

If the desire is to achieve additionality for green bonds by issuing more ABS, there are various ways the state can intervene to make this happen. First of all, for the reasons described above, it is essential that the state create the necessary regulatory environment for safe, reliable ABS. Furthermore, development banks can use the instrument of ABS in order to generate additional capital for sustainable projects. There are various possibilities for doing this.

#### 1. Development banks take on the risk

Development banks can invest specifically in ABS issued by issuers from countries in the global South and in particular choose the unsecured tranches, i.e. the riskiest ones, which provide security for the secured tranches. This would strengthen the trust of private investors in the secured tranches and thus encourage private investment in them. With this ap-



proach, additionality is achieved because possibilities are created for private investors to invest with a calculable risk in sustainable projects in riskier countries.

## 2. Development banks issue their own ABS

Development banks are currently supporting the issuing of green bonds in countries of the global South by sometimes taking on complete offerings of green bonds from these countries. For example, the World Bank subsidiary IFC, which is responsible for promoting the private sector in these countries, buys green bonds in countries like Morocco, India and Peru. This promotes expertise in issuing green bonds. Often the bonds are issued in local currency, which means that the issuer is spared the risk of repayment in a hard currency. This supports the granting of green loans in countries of the global South. Since the development banks have so far only used their own capital to buy these bonds, however, these activities do not involve generating additional private capital.

Development banks could however go one step further. In the same way that Fannie Mae in the US uses its expertise in financing housing to issue its own ABS, development banks could provide initial financing for sustainable projects in countries of the global South, bundle these loans and, if there are enough similar projects, securitise the loans and issue them as an ABS on the capital market whilst retaining a share of the loans. Unlike the situation with their own bonds, in the case of these ABS there is no right of recourse to the development bank should the projects default. That does mean a higher risk for the investor, but the advantage would be that the profit would be higher. However, for the effectiveness of this instrument, it is crucial that the banks

are no longer limited in financing green projects by the amount of capital they have available themselves. With ABS they could actually generate additional private capital. The long years of experience that these banks have with financing development would also ensure that investors have faith in these ABS. Unlike the situation when the bank takes on the unsecured tranche of green ABS, in this case, the expertise and the good reputation of the development banks with regard to financing projects in the global South would also come into play, and not just their financial power. In cases where it makes sense to issue an ABS in local currency, the development bank could take on the additional task of guaranteeing the exchange risk.

Such a development would require many development banks to rethink the way they do business. They would not only finance big projects but also more and more small and medium-scale projects and would have to be in direct contact with private financial investors. Such a development would however be desirable, because it represents a very good possibility for making green bonds into an effective instrument that helps to generate additional capital from private investors in countries where it is urgently needed. Experts anticipate that this kind of product would be in high demand among institutional investors (statements in meetings with experts).

# 7 Conclusion

1. In a climate of liberalisation and hence of diminishing state influence on substantial areas of the economy and in the wake of the financial crisis and the reduced financial power of many states, green bonds are a glimmer of hope. They show that private investors are very interested in financing the environmental restructuring of the economy. Despite voluntary self-regulation mechanisms in the finance industry that function well, green bonds do have weaknesses that have so far prevented them from realising their full potential for generating additional capital.
2. Probably the greatest weakness is the lack of transparency. Only 186 out of 429, i.e. 43% of issuers, disclose all or some of their projects. Even when projects are disclosed, there is usually a lack of important information, such as the investment amount. Yet, in order to prevent greenwashing and make sure in the long term that sustainable investors have the faith necessary for the market to grow, there must be full disclosure. By documenting all projects, allocating the projects to individual bonds and disclosing how much has been invested in each case, the green

bonds of the European Investment Bank are setting a standard that should apply to the entire sector.

3. The projects disclosed so far show a high degree of conformity with the Green Bond Principles and only about 2% are affected by controversial environmental or social concerns. That sends a positive signal to sustainable investors. However, the aforementioned problems should be addressed.
4. Another big weak point of green bonds is the lack of proof that they actually make additional money available. Very different analyses come to the conclusion that so far there has only been marginal evidence of such additionality. That does not correspond to the expectations of sustainable investors and it also does not meet the imperatives of impending climate change and advancing environmental destruction.

There are various possibilities for ways that state regulation can promote the additionality of green bonds. Besides regulation of the real economy and the financial market, a good way would be to require more transparency from issuers of green bonds and proof of additionality in the form of a change in strategy. Furthermore, development banks can generate additional green capital by issuing ABS. It should be noted here that the potential impact of green bonds is highest in the medium risk sector.

## 8 Annex

### 8.1 List of experts interviewed

Interview partner	Institution	Date	Topic
Oguz Bardak	Finance in Motion	4 July 18	Leasing companies
Julie Becker	Luxembourg Stock Exchange	26 Sept 18	Additionality of green bonds
John Capel	Bench Marks Foundation	22 May 18	Renewable energies in South Africa
Bianca Denfeld	Advisor to development banks	19 June 18	Securitisation costs of small projects
Michael Flaschka	Union Investment	10 Aug 18	Pricing of green bonds
Rob Fowler	Climate Bond Initiative	17 Sept 18	Green ABS
Dr. Klaus Gabriel	University of Kassel	2 Aug 18	Studies on impact / pricing
Beate Hollweg	German Environment Agency	27 Sept 18	Green bonds from a political perspective
Cerstin Kratzsch	Energiekontor	26 Sept 18	Green bonds from the perspective of a green issuer
Karsten Kührlings	GLS Bank	18 Sept 18	Green bonds and sustainable investors
Udo Philipp	Finance Watch Deutschland	10 July 18	Securitisation
Margriet Rouhof	TenneT	8 Oct 18	Advantages of green bonds for issuers
Dhaval Vakil	Senvion	18 Sept 18	Advantages of green bonds for issuers

## 8.2 Bibliography

- 2° Investing Initiative (2018): Shooting for the moon in a hot air balloon? Measuring how Green Bonds contribute to scaling up investments in green projects. URL: <https://2degrees-investing.org/wp-content/uploads/2018/10/Green-bonds-updated-paper-Oct-2018.pdf> (last access: 26.09.2018).
- Allianz Climate Solutions GmbH (2017a): Technical Note: Allianz Climate and Energy Monitor 2017. Assessing the needs and attractiveness of low-carbon investments in G20 countries. URL: <https://newclimate.org/wp-content/uploads/2017/07/allianz-climate-and-energy-monitor-2017-technical-note-final.pdf> (last access: 28.09.2018).
- Allianz Climate Solutions GmbH (2017b): Allianz Climate and Energy Monitor 2017. Assessing the needs and attractiveness of low-carbon investments in G20 countries. URL: <https://2degrees-investing.org/wp-content/uploads/2018/10/Green-bonds-updated-paper-Oct-2018.pdf> (last access: 28.09.2018).
- Bonds & Loans (2017): Azure Power CEO on Building Green into Corporate DNA. URL: <http://www.bondsloans.com/news/article/1614/azure-power-ceo-on-building-green-into-corporate> (last access: 11.10.2018).
- Cames, M./ Harthan, R. O./ Füssler, J. et al. (2016): How additional is the Clean Development Mechanism? Analysis of the application of current tools and proposed alternatives. Berlin. URL: [https://ec.europa.eu/clima/sites/clima/files/ets/docs/clean\\_dev\\_mechanism\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/ets/docs/clean_dev_mechanism_en.pdf) (last access 28.09.2018).
- Carbon Pulse (2018): Global CO2 trading volume up 5% in 2017, value up 22% as major markets extend rules-analysts. URL: <https://carbon-pulse.com/45997/> (last access: 28.09.2018).
- Climate Bond Initiative (CBI) (2017a): Bonds and Climate Change. The State of the Market 2017. URL: [https://www.climatebonds.net/files/reports/cbi-sotm\\_2017-bondsclimatechange.pdf](https://www.climatebonds.net/files/reports/cbi-sotm_2017-bondsclimatechange.pdf) (last access: 26.09.2018).
- Climate Bond Initiative (CBI) (2017b): Low Carbon Land Transport and the Climate Bonds Standard. Background Paper to Eligibility Criteria Low Carbon Transport Technical Working Group. URL: <https://www.climatebonds.net/files/files/Low%20Carbon%20Transport%20Background%20Paper%20Feb%202017.pdf> (last access: 27.09.2018).
- Climate Bond Initiative (CBI) (2017c): China Green Bond Market 2016. URL: <https://www.climatebonds.net/files/SotM-2016-Final-WEB-A4.pdf> (last access: 28.09.2018).
- Climate Bond Initiative (CBI) (2017d): Bonds and Climate Change. The State of the Market. Update 2017. India. URL: <https://www.climatebonds.net/files/files/CB-HSBC-2017-India-Final-09.pdf> (last access: 11.10.2018).
- Climate Bond Initiative (CBI) (2017e): Green Securitisation: unlocking finance for small-scale low carbon projects. URL: [https://www.climatebonds.net/files/files/March17\\_CBI\\_Briefing\\_Green\\_Securisation.pdf](https://www.climatebonds.net/files/files/March17_CBI_Briefing_Green_Securisation.pdf) (last access: 12.10.2018).
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Publisher) (2018): Green Bonds – Ecosystem, Issuance Process and Case Studies. URL: [https://webapp.sebgroup.com/mb/mblib.nsf/a-w/3c57af239091dddfc125822400522b99/\\$file/giz\\_seb\\_greenbondpublication\\_web.pdf](https://webapp.sebgroup.com/mb/mblib.nsf/a-w/3c57af239091dddfc125822400522b99/$file/giz_seb_greenbondpublication_web.pdf) (last access: 26.09.2018).
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Publisher) no yr.): The Potential of Green Bonds, A Climate Finance Instrument for the Implementation of Nationally Determined Contributions? URL: <https://www.giz.de/fachexpertise/downloads/giz2017-en-climate-finance-green-bonds.pdf>
- Development Assistance Committee (DAC) (2016): DAC Working Party on Development Finance Statistics. Implementation of the principles of ODA modernization on private-sector instruments. Template for the ODA-eligibility assessment of DFIs and other vehicles and reporting on additionality. URL: [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DCD/DAC/STAT\(2016\)1&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DCD/DAC/STAT(2016)1&docLanguage=En) (last access: 10.10.2018).
- DiaCore (2016): The impact of risks in renewable energy investments and the role of smart policies. URL: <http://publica.fraunhofer.de/dokument-e/N-382909.html> (last access 28.09.2018).
- ENGIE (2016): Registration Document 2015. Including annual financial report. URL: <https://www.engie.com/wp-content/uploads/2017/09/registration-document-2015.pdf> (last access: 02.10.2018).
- Environmental Justice Atlas (2015): Rampur Hydro - electric Project. HP, India. URL: <https://ejatlas.org/conflict/rampur-hydroelectric-project-india> (last access: 27.09.2018).
- European Commission (2011): Emissions trading: Commission welcomes vote to ban certain industrial gas credits. URL: [http://europa.eu/rapid/press-release\\_IP-11-56\\_en.htm](http://europa.eu/rapid/press-release_IP-11-56_en.htm) (last access: 28.09.2018).



- European Commission (2018a): Action Plan: Financing Sustainable Growth. URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0097&from=EN> (last access: 26.09.2018).
- European Commission (2018b): Regulation of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment. URL: [https://cric-online.org/images/CRIC/Taxonomie-VO\\_en.pdf](https://cric-online.org/images/CRIC/Taxonomie-VO_en.pdf) (last access: 26.09.2018).
- Fannie Mae (2018): Fannie Mae Wins Recognition as Largest Issuer of Green Bond by the Climate Bonds Initiative. Award Acknowledges Fannie Mae's Development of Green Finance and Green Bond Markets in 2017. URL: <http://www.fanniemae.com/portal/media/corporate-news/2018/green-bond-award-6680.html> (last access: 26.09.2018).
- Friends of the Earth United States, BankTrack, International Rivers (no yr.): Issue Brief: Green Bonds. URL: [https://www.banktrack.org/download/green\\_bonds\\_fact\\_sheet\\_pdf/green\\_bonds\\_fact\\_sheet.pdf](https://www.banktrack.org/download/green_bonds_fact_sheet_pdf/green_bonds_fact_sheet.pdf) (last access: 27.09.2018).
- Giegold, S./ Philipp, U./ Schick, G. (2016): Finanzwende. Den nächsten Crash verhindern. Berlin.
- Green Finance Committee of China Society of Finance and Banking (2015): Preparation Instructions on Green Bond Endorsed Project Catalogue (2015 Edition). URL: <https://www.cbd.int/financial/green-bonds/china-instruction2015.pdf> (last access: 02.10.2018).
- Green Growth Best Practice Initiative (GGBP) (2014): The Moroccan Agency for Solar Energy and the Moroccan Solar Plan. URL: [http://www.greengrow-thknowledge.org/sites/default/files/downloads/best-practices/GGBP%20Case%20Study%20Series\\_Morocco\\_Moroccan%20Agency%20for%20Solar%20Energy%20%26%20Moroccan%20Solar%20Plan.pdf](http://www.greengrow-thknowledge.org/sites/default/files/downloads/best-practices/GGBP%20Case%20Study%20Series_Morocco_Moroccan%20Agency%20for%20Solar%20Energy%20%26%20Moroccan%20Solar%20Plan.pdf) (last access: 28.09.2018).
- International Capital Market Association (ICMA) (2018): Green Bond Principles. Voluntary Process Guidelines for Issuing Green Bonds. URL: <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2018/Green-Bond-Principes---June-2018-140618-WEB.pdf> (last access: 26.09.2018).
- International Organization for Standardization (ISO) (2018): The secret to unlocking green finance. In: ISOfocus, 2018, #128, S. 39-45. URL: [https://www.iso.org/files/live/sites/isoorg/files/news/magazine/ISOfocus%20\(2013-NOW\)/en/2018/ISOfocus\\_128/ISOfocus\\_128\\_en.pdf](https://www.iso.org/files/live/sites/isoorg/files/news/magazine/ISOfocus%20(2013-NOW)/en/2018/ISOfocus_128/ISOfocus_128_en.pdf) (last access: 10.10.2018).
- International Renewable Energy Agency (no yr.): Global Trends in Renewable Energy Investment 2017. URL: <http://resourceirena.irena.org/gateway/dashboard/?topic=6&subTopic=11> (last access: 28.09.2018).
- International Rivers (2012): Comments on the Jirau Hydropower Project Submitted to Lloyd's Register Quality Assurance Ltd. URL: <https://www.internationalrivers.org/resources/comments-on-the-jirau-dam-brazil-7477> (last access: 27.09.2018).
- Kuhlmann, W. (2018): Eukalyptus und Green Bonds. Studie für Südwind - Institut für Ökonomie und Ökumene. [unpublished]
- Lucon, O./ Üрге-Vorsatz, D./ Zain Ahmed, A. et al. (2014): Buildings. In: Edenhofer, O./ Pichs-Madruga, R./ Sokona, Y. et al. (Publisher): Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, New York, p. 671-738.
- Paris Agreement: <https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>, (last access 12 October 2018).
- Prag, A./ Röttgers, D./ Scherrer, I. (2018): State-Owned Enterprises and the Low-Carbon transition. OECD Environment Working Papers, No. 129, OECD Publishing, Paris. URL: <https://www.oecd-ilibrary.org/docserver/06ff826b-en.pdf?expires=1538130850&id=id&accname=guest&checksum=DCC568814E36809C1850319F5765EAEC> (last access: 28.09.2018).
- SEB (2017): Green Bond Workshop II: Monitoring, Reporting & Market Aspects. URL: <https://www.cbd.int/financial/greenbonds/seb-bondsteps2917.pdf> (last access: 26.09.2018).
- Securities and Exchange Board of India (SEBI) (2017): Disclosure Requirements for Issuance and Listing of Green Debt Securities. URL: [https://www.sebi.gov.in/legal/circulars/may-2017/disclosure-requirements-for-issuance-and-listing-of-green-debt-securities\\_34988.html](https://www.sebi.gov.in/legal/circulars/may-2017/disclosure-requirements-for-issuance-and-listing-of-green-debt-securities_34988.html) (last access: 26.09.2018).
- Steiner, F (2001): Regulation, Industry Structure and Performance in the electricity supply Industry. IN: OECD Economic Studies No. 32, 2001/I. S. 143-182. URL: <https://pdfs.semanticscholar.org/6b61/c25383231b8885bca6a211711ec843bcd844.pdf> (last access: 12.10.2018).
- Toyota (2018): CO<sub>2</sub>-Ziele 2021: Toyota Hybridpalette schon längst unter 95 g/km. URL: <https://www.toyota.de/news/co2-ziel-mit-toyota-hybridpalette-erreicht.json> (last access: 27.09.2018).
- Zerbib, O. D. (2016): Is There a Green Bond Premium? The Yield Differential Between Green and Conventional Bonds. URL: <https://ssrn.com/abstract=2889690> (last access: 28.09.2018).

# Great Expectations

## *Credibility and additionality of green bonds*

Scientists' warnings that the impacts of climate change will be a disaster are becoming more and more urgent. The calculations for the volume of capital that will be needed to change course towards a more socially and environmentally sustainable way of doing business are on the table. There is agreement that this capital will mainly need to come from private investors. Green bonds are a beacon of hope. The demand for these

bonds, which are used to finance sustainable projects, far exceeds the supply. However, are these green bonds really as green as they maintain they are and do they really produce additional funding for sustainable projects? This study looks at both these questions and develops a proposal for a way to increase the impact of green bonds.



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