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THE SUSTAINABLE INVESTMENT INSTRUMENT: GREEN BOND

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INTRODUCTION

The causes of warming of the Earth's surface is to be addressed to greenhouse gases. They act as a partial blanket for the longwave radiation coming from the surface and this effect is known as the natural greenhouse effect. While nitrogen and oxygen, which represent most part of the air, do not have such effect, carbon dioxide and water vapor are considered the main greenhouse gases. In fact, clouds have a blanketing effect similar to that of the greenhouse gases even though their effect is offset by their reflectivity, exerting, on average, a cooling effect on climate (this event can be explain comparing cloudy nights with clear nights: clouds radiate longwave energy back to Earth's surface hence nights with clouds tend to be warmer). There have been many discussions and debates about climate change and carbon emissions, looking for causes and solution to fight global warming, however, the facts that have found a common agreement upon are: human activities as first cause, which have intensified the blanketing effect through the emissions of GHG such as, methane, nitrous oxide and carbon dioxide. Pollution has increased exponentially from the second half of the 20th century[1]. The second fact is the increasing of average temperatures, especially over the past 30 years, where the last five years were the hottest ever recorded (2019)[2]. Human activities, as deforestation and burning of fossil fuels like coal, oil and natural gases, in the industrial era, have caused the level of carbon dioxide to increase by 35%, modifying dramatically the chemical composition of the atmosphere, leading to significant consequences for the climate. Nature follow precise rules, therefore it is clear that artificial changes in several features of the climate, such as temperature (both in the atmosphere and ocean), ice sheets' size and distribution and differentiation of vegetation, will change these rules, influencing negatively the equilibrium on air and on ground, bringing about drastic changes in the conditions of the weather. Global warming caused by greenhouse gases is a vicious circle following the cause and effect relationship. This is because everything on Earth is connected and works in synergy. In fact, as GHG level rises, snow and ice start melting. This causes darker land and water to come out (they were under the snow and ice) and with their "darker" surfaces, they are able to absorb more heat sent by the sun, leading to an increase in temperatures, which eases melting even more. This process is called 'ice-albedo feedback' and intensifies the warming brought about initially by greenhouse gases and their increasing level. Important studies and researches have been made by scientists from all over the world to understand, discover and analyze quantitatively the evolution of effects addressing climate change. The climate, having changed clearly impacting more frequently, has brought people closer to the global warming matter, seeing also protests and movements, as Fridays for Future being the most notorious example, trying to beg governments to act.

1 Intergovernmental Panel on Climate Change AR5 Working Group 1: Climate Change 2013: The Physical Science Basis

2 NASA

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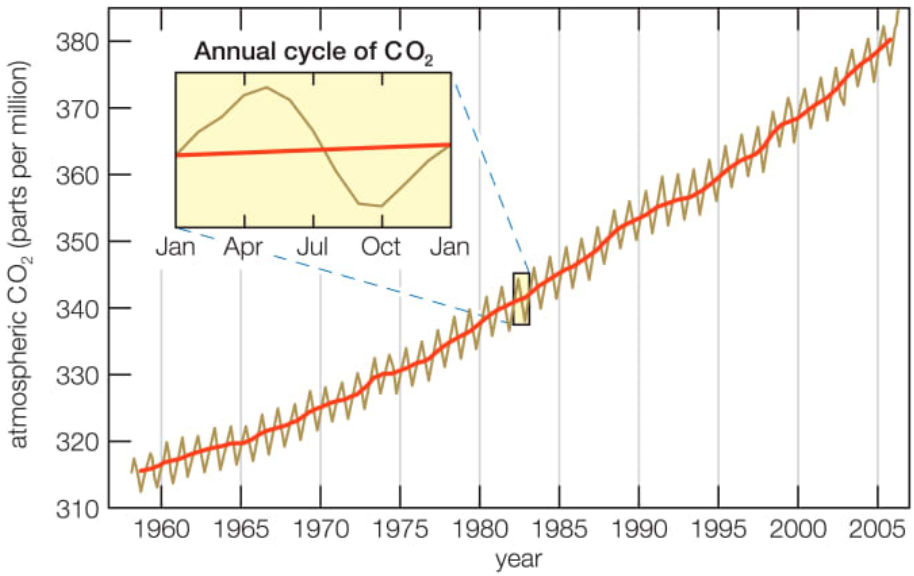
CHAPTER 1- History of the awareness of Climate Change

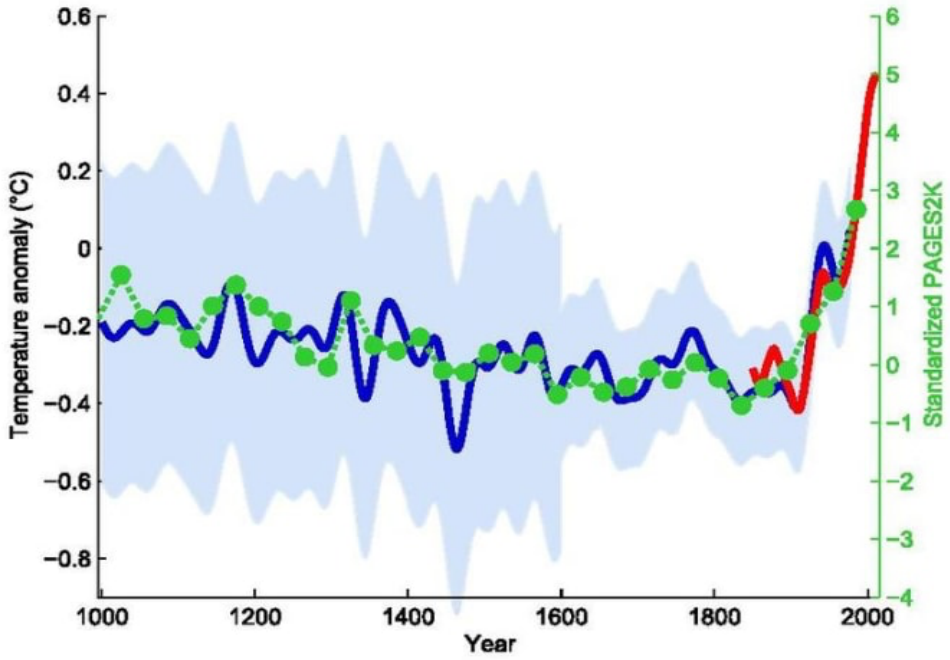
1.1 Disruptive discoveries: Keeling Curve and Hockey Stick Graph

One of the most crucial scientific works of the last century, which consisted of one of the first key readings of the actual wellbeing of the planet Earth, was done by the American scientist named Charles David Keeling at the U.S. Weather Bureau observation station located atop Mauna Loa volcano in Hawaii. The Keeling Curve reflects the record amounts measured of carbon dioxide in the atmosphere, the results come from continuous daily readings for over sixty years. The most striking point observed is the fact that the Keeling Curve over those past six decades, showed a steadily upwards zig-zag trend. The first Mauna Loa measurement was back in March 1958, and measured a reading of 313 parts per million (ppm), which when interpreted means that for every million molecules of gas in the atmosphere, 313 of them where CO2. Keeling also discovered something relatively surprising and worth mentioning, the level of CO2 had a maximum and minimum where it increased by 1 ppm, in May showing the optimum point, and then declining towards October, from where it rose again because it is an annual cycle. This up and down movements, the vicious annual cycle, was showed to keep happening also in the following year. To understand fully the discover, must be taken into consideration the fact that the northern hemisphere has more land mass, hence more vegetation, compared to the southern hemisphere. It can be said that the Keeling Curve has captured Earth “breathing” by showing the environmental cycle throughout the four seasons. Above the equator in spring and summer vegetation comes alive and absorbs huge amount of carbon dioxide from the atmosphere while lowering this effect in winter. Although the seasonal variation created a zigzag, and seemed like just a continuous cycle, it soon became clear that the zig zag was trending upward and not just repeating itself annually. Science historian Spencer Weart described the Keeling Curve as “the central icon of the greenhouse effect”, defining it in his book, *The Discovery of Global Warming,* not quite the discovery of the reason or cause of the global warming but as the discovery of the possibility of understanding the reason of global warming.



The Keeling Curve was one of the first graphs that showed interesting results, but ever since another graph was introduced, which is the so-called “hockey-stick” climate graph. It was first published by Michael E. Mann, an American climatologist and geophysicist, who is currently director of the Earth System Science Center at Pennsylvania State University, he started the theory by making use of advanced type of statistical techniques to look for regional variations in the hemispherical climate reconstruction for the data records of over the past 600 years. In 1999 the same team used these techniques to produce a reconstruction covering even the past 1,000 years (MBH99), which was the introduction of the hockey-stick graph as we know it, the name arose from the shape of the graph. When interpreting the results, it can be concluded that the movements are relatively stable up from AD 1000 with stable global temperatures, but then is visible a sharp spike upward during the 20th century that closely tracks with the the Mauna Loa measurements.

The term *hockey stick* was not used actually by Michael E. Mann himself, but firstly got introduced by the climatologist Jerry D. Mahlman, to describe the pattern this graph clearly showed, and the description included the fact that there is a relatively flat movement to 1900, being the hockey stick shaft, and then the sharp increase that represents the blade. Just like Keeling Curve also did, both are somehow in their own way iconic for the explanation of climate change, because it tells a rather simple story, as Mann said “You don’t need to understand the complexities of climate science to understand what either of these curves tell us: that human activity is having a profound impact on Earth’s environment.”



The original northern hemisphere hockey stick graph of Mann, Bradley & Hughes 1999, the blue line tracks the iconic hockey stick trend in rising temperatures with its uncertainty range in light blue, overlaid with green dots showing the 30-year global average of the PAGES 2k Consortium 2013 reconstruction. The red curve shows measured global mean temperature, according to HadCRUT4 data from 1850 to 2013.

1.2 The IPCC and the COPs: the role of science on spurring actions to mitigate climate change

Throughout the last four decades, awareness of the consequences brought about by the standard living of societies, industrialization and globalization on the planet, have brought countries to get together, trying to understand what has happened and what may happen in the future, how to prevent it, assessing the damages inflicted and how has climate changed so far. These are the facts that made come to live the Intergovernmental Panel on Climate Change (IPCC), which was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) back in 1988. This organization dedicates itself to providing the world with objective, and scientific information which is all relevant to try to understand the scientific basis of the risk of human-induced climate change, its natural, political, socio-economic impacts and risks and possible response options and elements for inclusion in a possible future international convention on climate. The IPCC itself does not carry out new research nor does it monitor climate-related data, what it actually does to assess is to convert and interpret already published data and the peer reviewed scientific secondary literature on the regarding topics. Since the moment it got establishment, the IPCC has had five assessment cycles up until now, leading to the five assessment reports that are about the climate changes on a global basis, and from which this information has

also been used to impact the policies made by governing bodies regarding the international climate impacts.

In 1990, the First IPCC Assessment Report (FAR), of the in total five reports, emphasized the importance of climate change awareness, since it got noted that climate change was becoming a real challenge with real consequences on a global level, meaning that cooperation was needed to face and tackle the problem. The first report also played a crucial role in the inspiration of the creation of the United Nations Framework Convention on Climate Change (UNFCCC), which is the key international environmental treaty that got introduced and accepted in 1992, at the Earth Summit in Brazil, the organization focuses on reducing global warming (and the impacts), and tries to cope with the consequences of climate change. Government leaders started to get aware and noted, that is when the debates started, in order to try to lower the outflow of greenhouse gas emissions which is a direct impact on the outcomes if regulated well.

Then later in 1995 the Second Assessment Report was published, which provided crucial material for governments to go further from there on and decide to later adopt the Kyoto Protocol two years later. President Bill Clinton was the one to sign the protocol, which lied upon the rationale to implement the goals set by the UNFCCC aiming at lowering the damages threatened by global warming by reducing the greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2). The treaty specifically aimed for reducing six type of greenhouse emission gasses of six greenhouse (Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF_6) in total in 41 countries (and including the European Union) to 5.2 percent, which is a target below 1990 levels.

The Third Assessment Report (TAR), which was published in 2001 focused the attention on the impacts of climate change and the need for adaptation, noticeable in the findings and also at the same time striking about this report was that the findings included projections about patterns and predictions of future average global temperatures, the rising sea levels expected, and the increased amount of times a heat wave could hit as a result of the global warming consequences. From this report also got clear, and specifically called out, that in times like this, and according to the predictions of the patterns, the developing countries (third-world countries), will be most vulnerable, and not being able to recover from the damages.

The Fourth Assessment Report (AR4) got published in 2007 by the IPCC, which set the foundations for the post-Kyoto agreement, which stated to try to limit global warming to only 2°C. The fourth

report is to be considered the basis for the upcoming COPs, where for instance, taking into consideration Mexico COP16, the participants agreed that "*climate change represents an urgent and potentially irreversible threat to human societies and the planet, and thus requires to be urgently addressed by all Parties".* The mentioned summit saw the target of a maximum 2°C global warming, and the part that all parties should take urgent action to meet this goal as something that they could recognize and implement. This led to the common agreement that greenhouse gases should be reduced and fought against the impacts of as soon as possible, but simultaneously recognizing the fact that the time frame for peaking will be longer in the developing countries, since in those countries in the hierarchy of needs but also in just the basic needs of any human life, first the social needs come and then the economic development will be looked into to improve the living standards, meaning that the environmental impacts get override by the other priorities, and have a long way to go still to be recognized. For this above mentioned reason the Cancún summit did end actually with the establishment of the Green Climate Fund (GCF), but then its funding was not agreed upon since it was not seen as an enforceable and successful movement. This problem was tried to be tackled and progress made from this point onwards in fact on following year Conference of Parties in South Africa (COP17) where eventually the management framework got adopted. The GCF was based on helping the relatively poor or developing countries to adopt to the environmental changes by distributing US$100 billion per year [32]. The conference agreed to start negotiations for all counties starting to adopt this from 2015 onwards, which means the period of post-Paris Agreement, with a legally binding deal for all.

The Fifth Assessment Report (AR5), which was finalized between 2013-2014, was the necessary and missing element of scientific input needed, to further convert and interpret the Paris Agreement outputs and impacts. The findings were rated on a confidence scale, with the likelihood of the outcomes being the probabilities 0%-100% distributed by using qualitatively rating from *very low* to *very high* and, where possible, quantitatively from *exceptionally unlikely* to *virtually certain* (determined based on statistical analysis and expert judgement).[1]

Likelihood scale used in the report

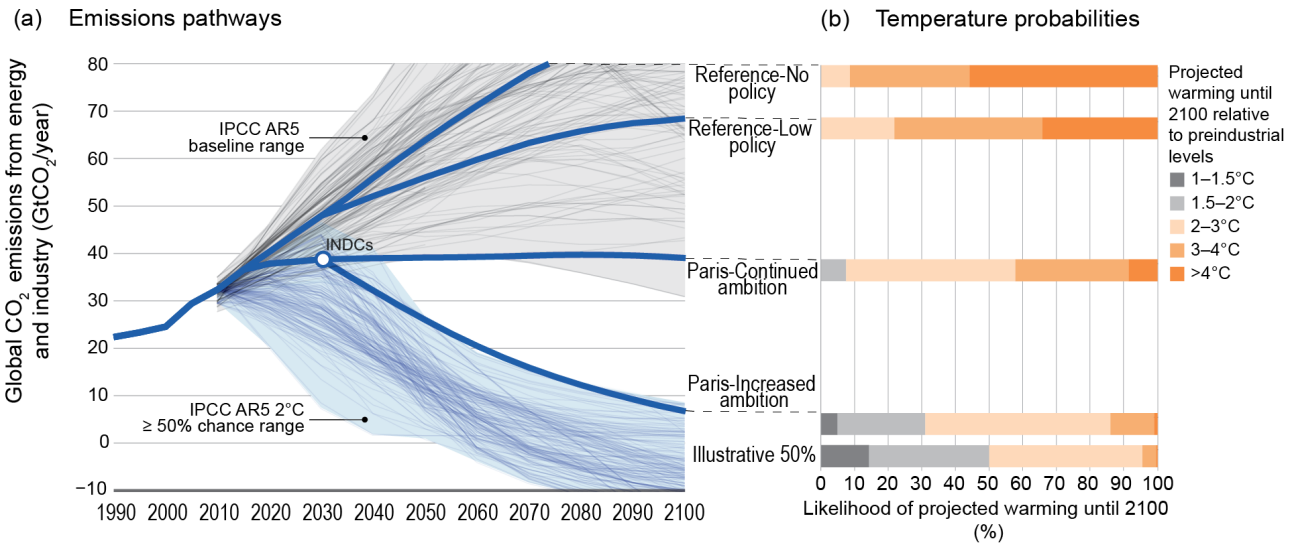
Term	Likelihood of the outcome
Virtually certain	99–100 % probability
Extremely likely	95–100 % probability
Very likely	90–100 % probability
Likely	66–100 % probability
More likely than not	50–100 % probability
About as likely as not	33 to 66% probability
Unlikely	0–33 % probability
Very unlikely	0–10 % probability
Extremely unlikely	0–5 % probability
Exceptionally unlikely	0–1 % probability

The key findings from this fifth report and the likelihood scale used included:

- The up warming of the atmosphere and oceans are *unequivocal*. Many of the associated impacts such as sea level change (among other metrics) have already been occurred since 1950 at rates unprecedented in the historical records
- It is *extremely likely* that human influence has been the dominant cause of observed warming since 1950, with the level of confidence having increased since the fourth report
- The longer we wait to reduce our emissions, the more expensive it will become to do so in the future
- It can be said with *high confidence* that the Greenland and Antarctic ice sheets have been losing mass in the last two decades and that Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent
- There is *high confidence* that the sea level rise since the middle of the 19th century has been larger than the mean sea level rise of the prior two millennia
- It is *likely* (with medium confidence) that 1983–2013 was the warmest 30-year period for 1,400 years
- The global water cycle will eventually and undeniably change, with an increase in the level of disparity between wet and dry regions, as well as wet and dry seasons, with some regional exceptions

- The oceans will continue to warm up further, with heat extending to even the deep ocean, affecting circulation patterns
- Future surface temperatures will be largely determined by cumulative CO2, which means climate change will continue even if CO2 emissions are stopped

The importance and the strength of the findings brought up by the IPCC were very crucial to the decisions to negotiate the Paris Agreement on climate change, during the Conference of Parties in Paris in 2015 (COP 21). During that period initially 196 parties agreed upon to adopt the climate change agreement, whereby the target was to start to face the global impacts of environmental issues. Then came the introduction to a far greater thing, potentially making the radical shift from making investment decisions focused on traditional carbon-intensive industry to rather low-carbon industry focuses. The Paris Agreement, the first-ever universal legally binding global climate change agreement, was seen as a bridge between today's policies and the climate-neutrality before the end of the century; and again as stated before it sets out the global framework to avoid dangerous climate change by limiting global warming to well below 2°C, but now even trying to pursue the efforts to limit it to 1.5°C, with this came the forcing of signatories to submit and report on their carbon emission targets (which later have been implemented at COP 24 in Katowice, Poland in 2018 with the establishment of a “rulebook” that included the uniform guidelines on reporting and measuring emissions by countries). The whole rationale is also to strengthen the countries’ abilities to deal with the impacts of climate change and support them in their efforts, for example the developed countries that agreed to supply $100 billion to fund projects in developing countries (Green Climate Fund). The agreement was ratified in the following year in New York on Earth Day, 22nd of April, when countries representing at least 55% of global greenhouse gas emissions signed on.



"Global CO_2 emissions and probabilistic temperature outcomes of government announcements associated with the lead up to the Paris climate conference. (a) Global CO_2 emissions from energy and industry (includes CO_2 emissions from all fossil fuel production and use and industrial processes such as cement manufacture that also produce CO_2 as a byproduct) for emissions pathways following no policy, current policy, meeting the government's' announcements with constant country decarbonization rates past 2030, and meeting the government's' announcements with higher rates of decarbonization past 2030. INDCs refer to Intended Nationally Determined Contributions which is the term used for the governments' announced actions in the lead up to Paris. (b) Likelihoods of different levels of increase in global mean surface temperature during the 21st century relative to preindustrial levels for the four scenarios. Although (a) shows only CO_2 emissions from energy and industry, temperature outcomes are based on the full suite of GHG, aerosol, and short-lived species emissions across the full set of human activities and physical Earth systems."

On the 1st of June 2017 Donald Trump made a decision to withdraw the U.S. from the Paris Agreement, which brought a lot of uncertainty around the country's commitment to reach the 2°C target, at least at the federal level. However these goals are necessary, especially on the long term in nature, and even if the U.S. wavers in its obligation over the next few years (in accordance with Article 28 of the Paris Agreement, a country cannot give notice of withdrawal from the agreement before three years of its start date in the relevant country and formal notice of intention to withdraw takes 12 months to take effect) progress is expected to continue globally. Despite Trump's will, 24 states and Puerto Rico, still committed to implement the policies whatsoever, to advance the goals of the Paris Agreement. Although climate scientists have outlined what needs to be done in order to limit the most severe long-term consequences of global warming and adapt to the irreversible effects that are already occurring, the challenges in implementing these changes are difficult to ignore and thus inevitable (international cooperation needed; all aligned). The main challenges include human inertia but also an inability or unwillingness to fathom the extent of the impact of an additional degree or two of warming. In 2018, reports from the Intergovernmental Panel on Climate Change and the U.S. National Climate Assessment provided at least two rather undesired conclusions. First, climate change is already occurring and significantly impacting millions of people in the U.S. and around the world on a daily basis. This includes coping with the higher and ever increasing temperatures and more frequent extreme weather events, or even food and water

shortages, displacement from homes and increases in infectious disease; meaning that the basic needs for humans and the living standards deteriorated. Second, if we are to meet the goal of limiting additional warming to 1.5°C above pre-industrial levels, unprecedented action must be taken immediately (again the longer we wait the more difficult and costly to face this). For example, the existing aging infrastructures are not equipped to handle the consequences of rising temperatures, and new technologies are needed for both mitigation and adaptation to this new reality. To increase the attention on the need to additional green financing initiatives, including green bonds, seems an obvious solution. The amount of investment needed is staggering though, estimated to be between $53 and $93 trillion over the next 15 to 20 years.[1] Being the debt-to-GDP ratios in developed economies already at or exceeding 100%, governments simply do not have the resources to make the needed investments to transition to a low/zero carbon economy.[2] Therefore, it means that Private capital is needed to fill this financing gap that we have left and face now. The global debt capital markets, with more than $100 trillion currently outstanding, is expected to play a vital role in this [3].

1 Climate Bond Initiative, based on International Energy Agency and New Climate Economy estimates

2 International Monetary Fund (IMF)

3 SIFMA

CHAPTER 2: Green Bonds

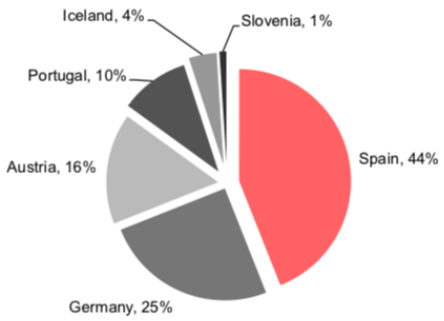
The pace of change is accelerating: the pace of technological developments has been speeding up exponentially over time. In order to keep up, a radical shift is needed in our view on changes, and how we approach them. With the ongoing environmental issues, there is a high demand for becoming more sustainable and it is the case also for the financial world. The climate change and the irreversible consequences it has been bringing with it, is slowly but surely becoming a matter that concerns all economic players. For the average investor, a green bond is an introduction of an incentive to become “greener” such diversity in their portfolios has tangible benefits to both the investors and the planet.

2.1 History of Green Bonds

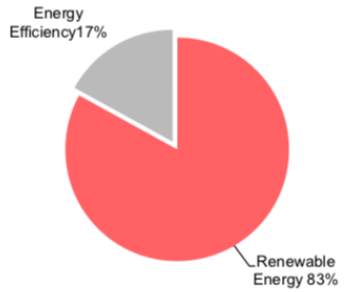
“We needed an idea to capture investor imagination to combine the force of capital markets to a good end”. Said Aldo Romani, deputy head of euro funding at the European Investment Bank. “The idea behind green bonds is very simple: you allocate the money you collect to projects that have a positive influence in the fight against climate change. At the same time you enable people around you to monitor what you do.” It was thanks to these ideas that the European Investment Bank (EIB) became the true pioneer of the green bonds asset class, issuing an equity index-linked bond the 4th of July 2007, called “Climate Awareness Bond” (CAB), which became the first fixed income product among socially responsible investments. The first CAB was used towards 14 projects in six different countries in 2007 and 2008, where the renewable energy projects made up the largest share by far (83%), followed by energy-efficiency projects (17%). The projects in renewable energy included hydro, wind, solar and geothermal energy production.

THE FIRST GREEN BOND: EUR 600MN ALLOCATED TO 14 PROJECTS IN 6 COUNTRIES IN 2007 AND 2008

Proceeds allocation by country



Proceeds allocation by sector



Source: EIB, UniCredit Research

The net proceeds of the issue were allocated within EIB's treasury to a specially created and isolated sub-arrangement of the operational currency advertise portfolio. That way, CABs are a transparent and accountable link between funds raised on capital markets and the funding of projects with environmental benefits. Until the bonds are settled, the secondary portfolio will be designate for spending to lending of renewables' and energy efficiency projects in the near future. While waiting for such disbursement, the sub portfolio will be put resources into currency showcase instruments (Source: EIB Climate Awareness Bonds prospectus, dated 18 May 2007).

The World Bank is to be considered the first to issue a bond with the actual "green" label. The green bond was issued in 2008 and stick to the traditional "plain vanilla" bond structure, differently from the EIB's equity-linked Climate Awareness Bond. It all started with a group of Swedish investors, moved by the increasing occurrences of natural disasters, who sought on how they could use the savings they were stewarding toward a solution. They approached World Bank through their bank, Skandinaviska Enskilda Banken AB (SEB). They were looking for products in all asset classes, that somehow addressed the challenges of climate change. SEB knew that the World Bank finances climate change mitigation and climate change adaptation projects through fixed income products. For the Scandinavian investors it was perfect, because they were looking for a product that supported these types of projects, but that didn't have project risk or specific country risk, and that had the same financial characteristics as other products they were familiar with. Investors were looking for a safe place where to place their money while knowing they were making a difference. The World Bank had a great track record as bond issuer, had the capacity to write about the effect of its undertakings and offered projects which finance environment matters, however how could financial specialists be really sure that the projects they were supporting would specifically address

the fight against climate change? CICERO, the Centre for International Climate and Environmental Research, an interdisciplinary research center for climate research in Oslo, was the solution. The Environmental Scientists from CICERO were leading experts on climate issues. They could provide a credible view on whether a project was going to make a positive impact on the environment. Christa Clapp, Research Director at CICERO said in an interview about the first green bond: "*The financial community and the scientific community tend to operate in two different spheres. And this was, from my understanding, the first connection between these two worlds. So we had to learn how to communicate with each other using two different languages; in financial vocabulary and research-oriented vocabulary; and try to understand what the other party needed*" [1]. This new model of coordinated effort among financial specialists, banks, advancement organizations and researchers made the plan for the present green bond market. It characterized the measures for ventures qualified for green bond support, including the second opinion suppliers as CICERO, and included effect announcing as a necessary piece of the procedure.

2.2 Understanding Green Bonds

To understand green bonds, first needs to be understood what a bond is. A bond is a form of debt security, used as a financial instrument for investments providing a stable income stream to the investor in the form of coupon payments. When reached maturity, the holder of the bond received a payment with the full face value of the bond. Characteristics of a regular bond include:

- **Coupon rate:** Coupon rate is the interest rate that the bondholders receives semi-annually (or annually). It is defined as the fixed return that an investor earns periodically until maturity. Not all bonds have a coupon rate.
- **Maturity date:** All bonds have maturity dates, that can be short-term or long-term ones. When a bond reaches maturity, the bond issuer pays back the investor the full face value of the bond.
- **Current Price:** The current price is contingent to the interest rate level at the moment of purchase. In facts a bond can be purchased at par, above or below par. When interest rate increases, bond's value decreases given the coupon rate being lower than the interest rate in the economy. Consequently, the bond will trade at a lower price (discount), which is below par.

As the table shows below, several types of bond exist, for example sovereign bonds, or corporate bonds, each of the type have different actors, however the approach and characteristics to them is the same with the repayment by getting the principal plus fixed interest returned. It is also commonly known, the higher the risk on a certain bond, the higher the (expected) returns vice versa.

Types	***Proceeds raised by bond sale are***	***Debt recourse***	***Example***
"Use of Proceeds" Bond	Earmarked for green projects	Recourse to the issuer: same credit rating applies as issuer's other bonds	EIB "Climate Awareness Bond" (backed by EIB); Barclays Green Bond
"Use of Proceeds" Revenue Bond or ABS	Earmarked for or refinances green projects	Revenue streams from the issuers though fees, taxes etc are collateral for the debt	Hawaii State (backed by fee on electricity bills of the state utilities)
Project Bond	Ring-fenced for the specific underlying green project(s)	Recourse is only to the project's assets and balance sheet	Invenergy Wind Farm (backed by Invenergy Campo Palomas wind farm)
Securitisation (ABS) Bond	Refinance portfolios of green projects or proceeds are earmarked for green projects	Recourse is to a group of projects that have been grouped together (e.g. solar leases or green mortgages)	Tesla Energy (backed by residential solar leases); Obvion (backed by green mortgages)
Covered Bond	Earmarked for eligible projects included in the covered pool	Recourse to the issuer and, if the issuer is unable to repay the bond, to the covered pool	Berlin Hyp green Pfandbrief; Sparebank 1 Boligkreditt green covered bond
Loan	Earmarked for eligible projects or secured on eligible assets	Full recourse to the borrower(s) in the case of unsecured loans. Recourse to the collateral in the case of secured loans, but may also feature limited recourse to the borrower(s).	MEP Werke, Ivanhoe Cambridge and Natixis Assurances (DUO), OVG

For green bonds, it is known as a debt security, a financial instrument, and thus again as a bond, but with a “green” feature to it, which leads to the key distinction compared to the regular ones. What this green feature is, will be explained more in depth. Where the raised funds of regular bonds is more for private use and/or profit-making, the raised funds of green bonds is dedicated to a better cause.

The green bond finances projects aimed at:

- Energy efficiency;
- Pollution prevention;
- Sustainable agriculture;
- Fishery and forestry;
- The protection of aquatic and terrestrial ecosystems;
- Clean transportation;
- Clean water;
- Sustainable water management.

This type of commitment can be an incentive for the issuers, since it covers their personal financial needs while also having positive externalities. Green bonds are intended to incentivize the awareness of environmental and sustainable problems, and the mitigation movement that comes with it. Besides the environmental benefits, the green bonds also come with tax incentives for the investors. Examples of tax incentives are tax exemption and tax credits, which makes these bonds even more attractive compared to the conventional bonds as we know them. Therefore, these green bonds become also attractive to the investors that do not care as much about being “greener”, by giving them a monetary incentive. They additionally need information that shows how they are tending to ESG factors, especially since they progressively get that, notwithstanding making social worth, they are relieving the hazard to their investments.

2.3 What Makes a Bond “Green”?

A bond is commonly viewed as "green" if the issuance continues are utilized exclusively to fund tasks or exercises that have a positive natural effect. It ought to be noticed that no conclusive rundown of green security qualified activities exists in the market. Issuers may evaluate whether a project is in accordance with climate mitigation or other ecological objectives and can "self-label" a bond as green, if they unveil to financial specialists the sorts of tasks being financed. Most of the time, for example, constructing a solar or wind farm is commonly clear assessment and a green name would not be unclear. In any case, as market size and financial specialist premium have developed, there has been developing interest for autonomous assessments to confirm that a green security is, to be sure, green. By far most of issuance presently includes an independent verification. Further, an expanding number of nations are establishing guideline that characterizes a standard for

green bond issuance, expelling any vulnerability around what comprises "green." Considering the bonds, regardless of whether self-named, freely checked or gave under a national green bond standard, money qualified activities and give the necessary divulgence, they are all piece of the named green security universe. Despite the fact that the “green” name has attracted investor consideration as an approach to distinguish securities that have a plainly disclosed use of proceeds that address environmental benefits, there is additionally a lot bigger (roughly $576 billion) universe of unlabeled green bonds [9]. Many groundwork plans that may be viewed as green-for instance, city water programs- were financed through security issuance some time before the generally ongoing advancement of the green bond market. Numerous guarantors of unlabeled green bonds may not feel the extra divulgence or cost of verification merits the money, or, on the other hand they may essentially be uninformed of the huge enthusiasm for marked green bonds. Another case of unlabeled green securities identifies with securities gave for general corporate purposes by "pure-play"[10] organizations, such as makers of solar panels or electric vehicles. In spite of the fact that the businesses of these organizations are innately environmentally friendly, most market members don't consider these securities to conform to best practices since the utilization of continues isn't determined at the time of issuance, and in this way the securities don't carry a green name. Proceeds could go towards environmentally friendly exercises or undertakings, but they could likewise back non-green exercises like dividend payment or share repurchase.

9 Climate Bonds Initiative. Bonds and Climate Change: The State of the Market In 2016.

10 Pure-play is defined as a company that is focused on only one industry or product.

2.3.1 Green Bond Principles

Therefore, green bonds have started to get the consideration of the two backers and financial specialists around the world. Albeit green bond issuance has detonated as of late, the year 2017 concluded as only 1% of all out-bond issuance during the year. Issuance of green bonds should expand hugely quite expeditiously to fund the tasks expected to progress to a low carbon economy. Notwithstanding government activities to address environmental change and supportable account, another explanation for the quick development of the green security advertise has been progress towards building up an ordinarily acknowledged meaning of what a green bond is, and towards creating measures against which green bonds can be assessed. In the initial not many long periods of the green security market presence, oneself named nature of the market prompted worries that guarantors could apply continues of "green" securities towards non-green intentions, here and there alluded to as "greenwashing". It was for this reason that prompted the International Capital Market Association to create the Green Bond Principles in 2014. Albeit willful, the Green Bond Principles

set out four center rules that have increased wide market acknowledgment by security guarantors, backers and financial specialists. Specifically, giving away from and detailing around the utilization of continues has become a characterizing highlight of green securities and gives a degree of straightforwardness expected to give certainty to speculators that they are funding green activities. Moreover, they have turned into the establishment for policymakers and market members trying to build up itemized guidelines.

The Green Bond Principles (GBP), are willful procedure rules, that suggest straightforwardness and exposure and advance trustworthiness in the improvement of the Green Bond advertise by explaining the methodology for issuance of a Green Bond. The GBP are planned for wide use by the market: they give backers direction on the key segments engaged with propelling a valid Green Bond; they help financial specialists by guaranteeing accessibility of data important to assess the natural effect of their Green Bond ventures; and they help guarantors by moving the market towards standard divulgences which will encourage exchanges. The GBP suggest an unmistakable procedure and exposure for guarantors, which speculators, banks, financiers, placement agents and others may use to comprehend the qualities of some random Green Bond. The GBP stress the necessary straightforwardness, exactness and honesty of data that will be revealed and announced by issuers to partners.

The GBP have four core components:

1. Use of Proceeds

The foundation of a Green Bond is the usage of the returns of the bond for Green Projects, which ought to be fittingly portrayed in the lawful documentation for the security. All assigned Green Projects ought to give clear ecological advantages, which will be surveyed and, where possible, measured by the backer. If all or an extent of the returns are or might be utilized for renegotiating, it is suggested that guarantors give a gauge of the portion of financing versus renegotiating, and where proper, likewise explain which speculations or undertaking portfolios might be renegotiated, and, to the degree applicable, the normal think back period for renegotiated Green Projects. The GBP unequivocally perceive a few general classifications of qualification for Green Projects, which add to ecological destinations, for example, environmental change moderation, environmental change adjustment, normal asset preservation, biodiversity protection, and contamination counteraction and control. The eligible Green Project categories include, but are not limited to:

- **renewable energy** (including production, transmission, appliances and products);

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

2. <u>Process for Project Evaluation and Selection</u>

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

- the environmental sustainability objectives;
- the process by which the issuer determines how the projects fit within the eligible Green Projects categories identified above;

- the related eligibility criteria, including, if applicable, exclusion criteria or any other process applied to identify and manage potentially material environmental and social risks associated with the projects.

Issuers are motivated to locate this converted data inside the setting of their larger goals, technique, strategy and additionally forms identifying with environmental sustainability. Guarantors are additionally motivated to unveil any green standard or certification referenced in project choice.

3. Management of Proceeds

The net proceeds of the Green Bond, or a sum equivalent to them, ought to be credited to a sub-account, moved to a sub-portfolio or in any case followed by the issuer in a proper way, and witness to by the latter in a formal inside procedure connected to his/her loaning and investment tasks for Green Projects. Until the Green Bond is unsettled, the equilibrium of the followed net proceeds ought to be intermittently changed in accordance with coordinate designations to qualified Green Projects made during that period. The issuer should inform investors about the proposed sorts of transitory position for the equalization of unallocated net continues.

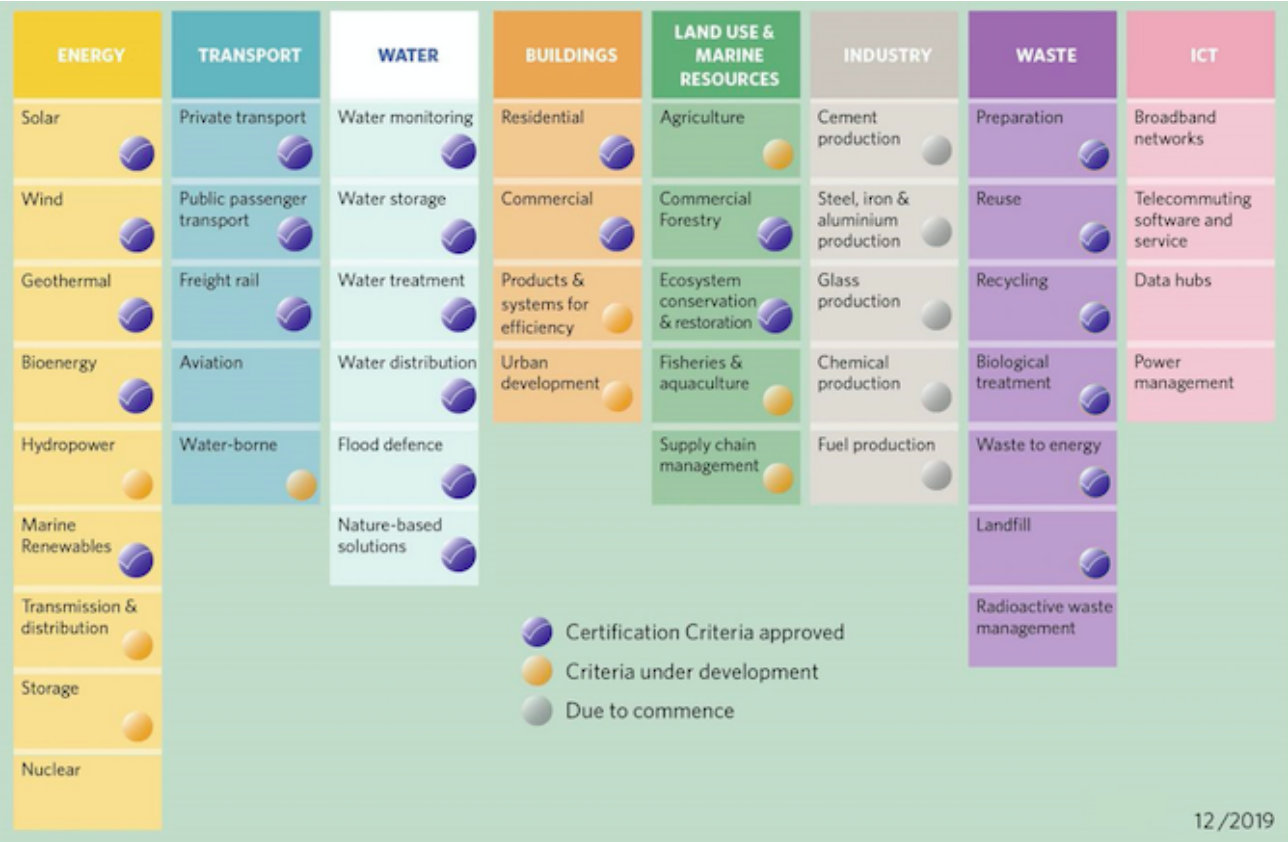
4. Reporting

Promptly accessible and updated data on the utilization of proceeds, should be made and kept by issuers, in order to be renewed yearly until full assignment, and on an opportune premise in the event of material developments. The yearly report ought to incorporate a rundown of the tasks to which Green Bond proceeds have been allotted, including also a concise report on the project and the sums allocated and their forecasted consequences. Where privacy understandings, serious contemplations, or countless basic tasks limit the measure of detail that can be made accessible, the GBP suggest that data is introduced in nonexclusive terms or on an aggregated portfolio premise (for example rate allotted to certain venture classes). Straightforwardness is of specific incentive in conveying the normal effect of tasks. The GBP suggest the utilization of qualitative performance marks and, where possible, quantitative execution measures (for example vitality limit, power age, ozone depleting substance discharges diminished/evaded, number of individuals furnished with access to clean power, decline in water use, decrease in the quantity of vehicles required, and so on.), and divulgence of the key basic approach or potentially suspicions utilized in the quantitative

assurance. Issuers with the capacity to screen accomplished effects are urged to incorporate those in their customary revealing.

2.3.2 Green Bonds Standard and Taxonomy

In 2015, the Climate Bonds Initiative, a non for profit rather charitable organization focused on the investors and attempting to prepare obligation markets for environmental change arrangements, built up normal, nitty gritty measures lined up with the Green Bond Principles, the Climate Bonds Standard. The CBI has built up an atmosphere perfect scientific categorization of qualified ventures and qualification rules for an attach to be authoritatively confirmed under the Climate Bonds Standard and Certification Scheme, which is utilized universally by security backers, governments, speculators and the money related markets to organize speculations which truly add to tending to environmental change, thus raising more awareness and contributions to addressing the problems of climate change.



Financial specialists, in this case specifically the investors, need autonomous, master drove direction on which ventures are a piece of a low-carbon economy and this foundation settled on by the CBI will ease dynamic and spotlight consideration on trustworthy environmental change arrangement openings. Issuers will have the option to mastermind to have their bonds

autonomously checked on and confirmed against this norm, giving extra confirmation and straightforwardness to speculators. The Climate Bonds Taxonomy categorization is a manual for atmosphere adjusted resources and tasks which means to empower and be a significant asset for regular green definitions across worldwide markets, such that underpins the development of a durable topical security advertise that conveys a low carbon economy and gives GHG emanations screening measures predictable with the 2-degree an unnatural weather change target, known as the global warming target set by the COP 21 Paris Agreement. The scientific classification, taxonomy explained before, is actually an apparatus for the issuers, investors known as financial specialists, governments and districts to enable them to comprehend what the key speculations and investments therefore are that will convey a low carbon economy. It has been developed based on the latest climate science including research from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA) and has benefited from the input of hundreds of technical experts from around the world.

How does the certification process for the Standard work in practice?

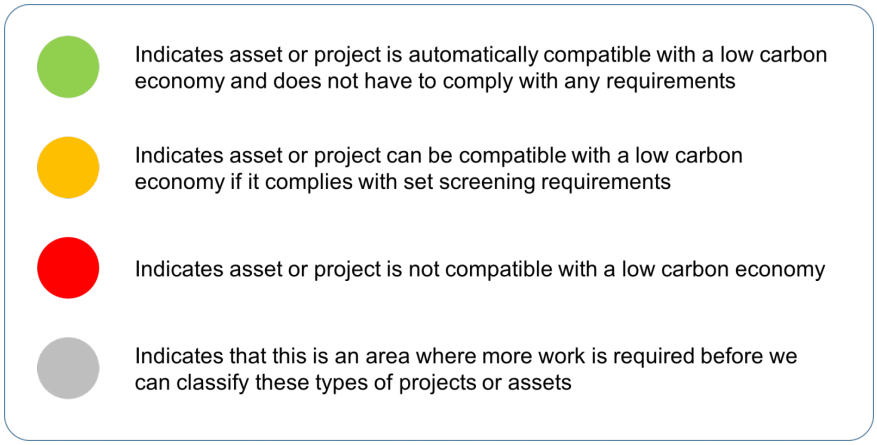
Pre-Issuance: The Climate Bond Standard allows Certification of a bond prior to its issuance, enabling the issuer to use the Climate Bond Certification Mark in marketing efforts and investor roadshow.

- It focuses on selection of eligible projects & assets, and the readiness of the issuer's internal processes to track and report on use of proceeds
- The issuer must engage a Verifier to provide assurance over the eligibility and readiness and submit this information for review of the Climate Bonds Standards Board

Post-Issuance: After the bond has been issued and allocation of the bond proceeds has begun, the issuer must follow through with confirming the Certification

- Focus on the actual use of proceeds, ongoing eligibility of the projects & assets, use of funds not yet allocated, and the adequacy of and output from the issuer's internal systems
- The issuer must engage a Verifier to provide assurance over the actual use of proceeds and reaffirm that internal systems & controls are functioning properly

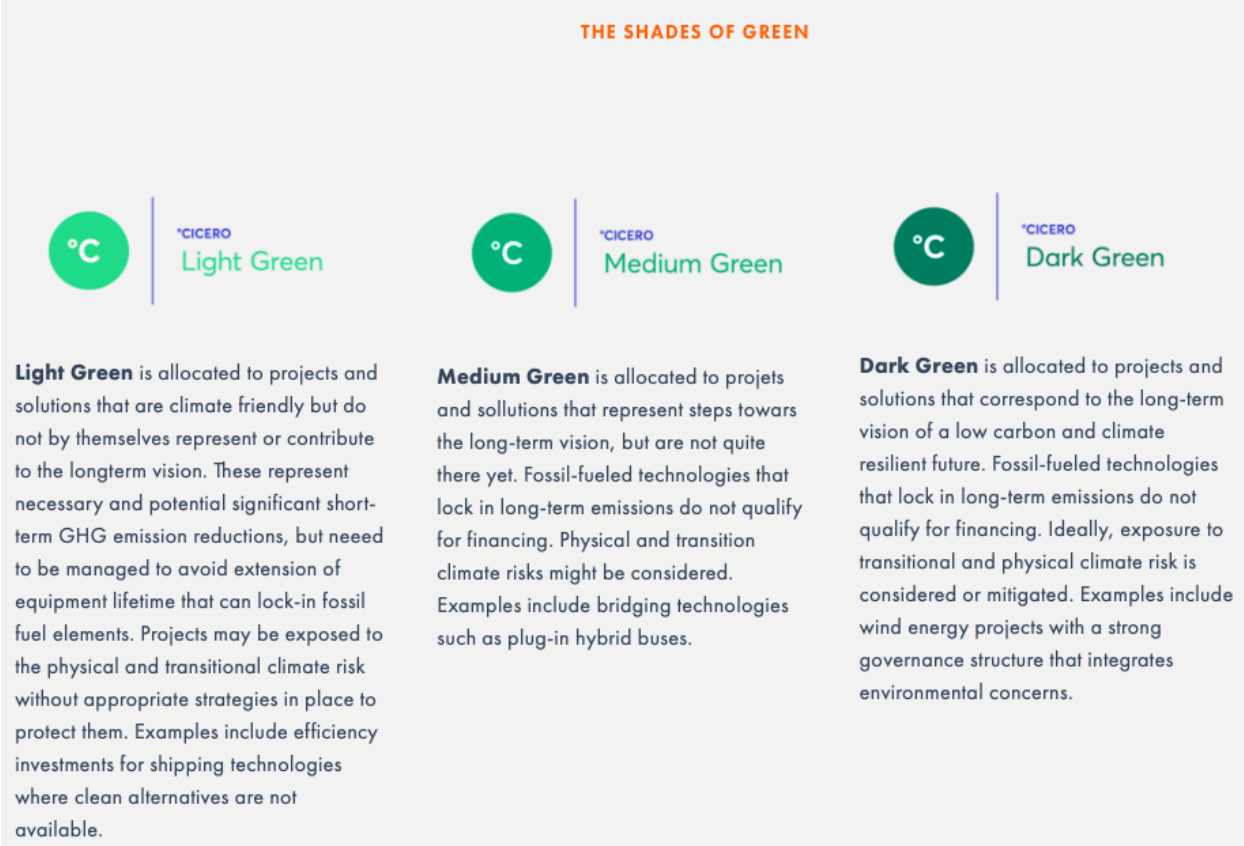
Thereafter, issuers must report at least annually on the projects & assets being funded by the bond, and their eligibility, and use of proceeds, including how any unallocated funds have been deployed. The Green Bonds Taxonomy uses a traffic light system to indicate eligible assets and projects:



Regulations have emerged in several markets that formalize green bond market practices and definitions to establish a legal definition of green bonds. Issuance in China surged after that country enacted guidelines, and the European Central Bank is soon expected to establish its own standard that covers reporting requirements and the verification process. Japan, India and ASEAN nations have all also adopted their own standards.

2.3.3 CICERO as a Second Party Opinion (SPO) provider

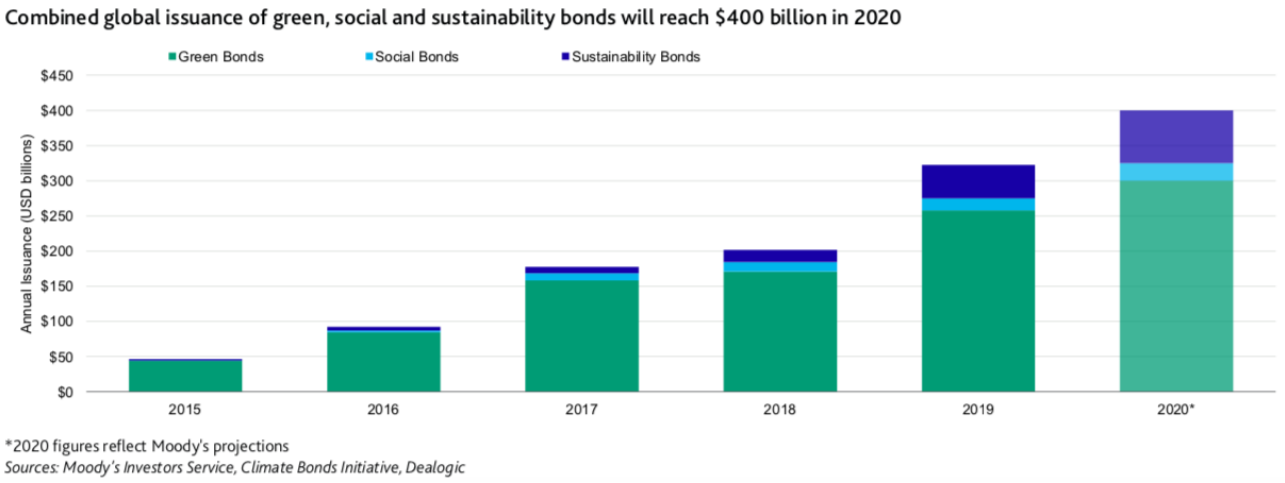
Second Party Opinions give an evaluation of the issuer's green bond system, breaking down the "greenness" of qualified undertakings/resources. Some likewise give a supportability "rating", giving a subjective sign of parts of the guarantor's system and arranged distribution of continues. CICERO, Center for International Climate Research Oslo, gives free surveys of green securities since the market's commencement and has built up an adaptable and adaptable answer for give ecological due determination. It evaluates whether a given movement or innovation underpins a low-carbon and atmosphere versatile society in the long haul. Now and again however, exercises or innovations that decrease emanations in the close term bring about a drawn-out utilization of high-discharging foundation and an expansion in net outflows in the long haul. CICERO, with its "Shades of Green" procedure endeavors to abstain from securing of outflows through cautious framework speculations, giving straightforward information on how well a green bond lines up with a low-carbon flexible future. The Green Bond Principles plot intentional direction for green securities, yet don't take a situation on the nature of green arrangements and this is the place CICERO Shades of Green discovers its vital job, to interface environmental change science with the budgetary markets. Surveying the ecological adequacy of green undertakings, CICERO's subsequent suppositions are reviewed Light Green, Medium Green and Dark Green.



2.4 Green Bond Market

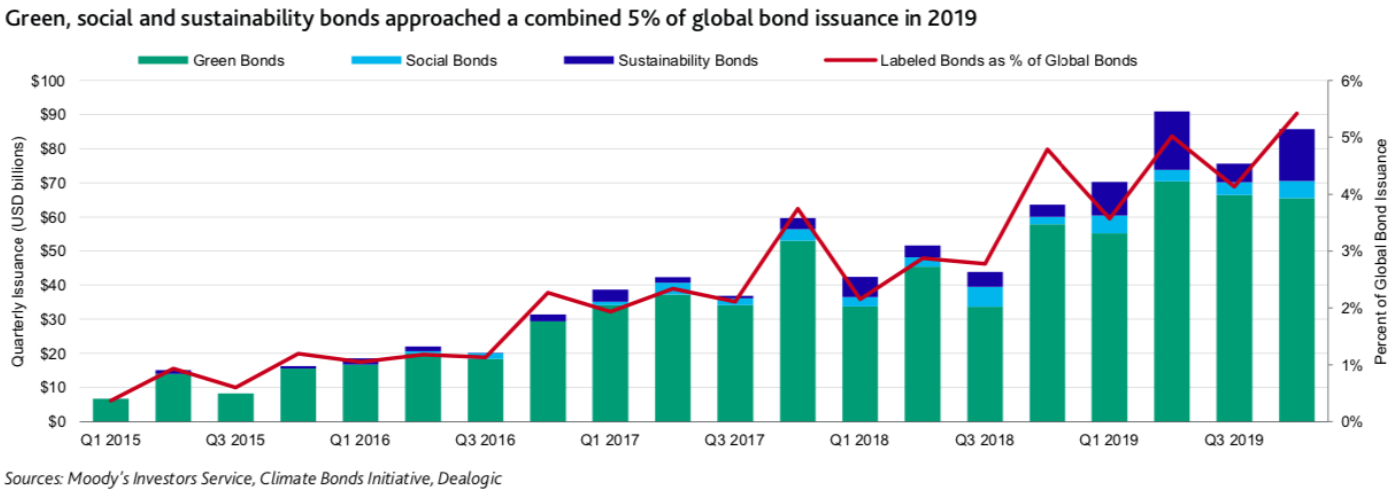
The green bond market has been exponentially expanding throughout the years, breaking its record a year ago, with issuance of $258 billion. What is driving this energy? Progressively, companies are seeing supportability as integral to their procedures and are setting more noteworthy incentive on the reputational and straightforwardness benefits related with green issuance. Familiarity with the ecological advantages of the hidden resources likewise keeps on rising, invigorating interest from a more extensive arrangement of financial specialists and bringing about speculator broadening. New political and sovereign commands are likewise assuming a job, for example, the European Union's Sustainable Finance Action Plan, which expects to address environmental change and quicken the progress to a low carbon economy by boosting green account. Green securities have been a useful asset to take advantage of the profound and fluid fixed pay market to move capital towards positive ecological effect. Whenever fixed salary instruments can bolster financing for green arrangements, they can likewise do as such for other sustainability purposes, from lightening neediness to bringing down joblessness rates among impeded gatherings. Thus, the green security advertise has extended to incorporate social and sustainability securities (which incorporate both social and green), beginning to see additionally green and supportability connected loans. The green security is the

main instrument of the economical market, generally because of its moderately straightforward nature. Its straightforwardness brings certain limitations, in particular restricting the utilizations for green, in any case, thus there has been a development of various kinds of maintainable bonds and advances to meet differing customer needs. Worldwide issuance of marked green, social and sustainability bonds is relied upon to hit $400 billion out of 2020, a 24% expansion over the $323 gave in 2019. By singular part, green bond issuance is required to reach $300 billion this year, up from $258 billion out of 2019, while social and sustainability bond issuance will reach $25 billion and $75 billion, separately, up from $17 billion and $48 billion a year ago.



The projected 24% growth in combined issuance would represent a moderation compared with the 60% growth achieved between 2018 and 2019. This forecast therefore reflects expectations for a healthy but maturing market, with growing use of new labels and structures. The fastest growth will occur among labeled sustainability bonds, a market segment that has already exhibited rapid growth that likely reflects issuers' desire to highlight their broad sustainability initiatives. Social bond issuance will also continue to grow, though the label will remain the least utilized of the three given the market's focus on climate and environmental projects, as well as a broader focus on sustainability. While green, social and sustainability bonds will continue to account for a relatively small portion of global bond volumes, their share of issuance will continue to increase, as it has in recent years. They went to cover from a 3% of total global issuance in 2018 to a 4.5% in 2019, seeing the highest ever share of global issuance coming in the fourth quarter of last year, when combined issuance represented 5.4% of global bonds. Their expected growth in combined issuance for all three labels in 2020, will likely be between 5% and 7% of total global bond issuance. As the table below shows, combined fourth-quarter 2019 labeled issuance totaled $86 billion, the second-

highest quarterly amount ever, trailing only the second quarter of 2019. Combined issuance was at least $70 billion in every quarter of 2019, higher than any single quarter of combined issuance before last year. Consistently strong issuance throughout the year reflected the market's steady growth as issuers continue to use the capital markets to raise awareness and finance their sustainability objectives. Green bonds continued to demonstrate solid growth in issuance volumes and issuer diversification in 2019, a trend that will continue in 2020 as the market continues its march toward maturation and the importance attached to climate mitigation and adaptation activities rises. Going from a 2018 figure of $170.6 billion of issuance, to 2019's $258 billion, global growth reached 51%, a notably strong increase over the 8% growth between 2017 and 2018. This growth was driven by continued strong volumes by repeat green bond issuers, as well as debut green bonds from a record 285 first-time issuers. Issuers from 51 countries, including supranational issuers, brought green bonds to market, another new record. More than 900 distinct issuers have now issued green bonds since 2007, providing a strong base to support future repeat green bond issuance.



2.4.1 Market Analysis 2018-2019

The 2019 volume was principally determined by the European market, which represented 45% of worldwide issuance. The aggregate sum of green bonds gave in Europe expanded by 74% (or $49.5bn) year-on-year, arriving at a sum of $116.7bn. This is trailed by the Asia-Pacific and North American markets, at 25% and 23%, individually. In 2019 the USA, China and France beat the nation rankings indeed. Together they represented 44% of worldwide issuance in 2019. US backers contributed $51.3bn to the aggregate, though their Chinese and French partners put up $31.3bn1

and $30.1bn for sale to the public. A year ago, observed the presentation of green security issuances from Barbados, Russia, Kenya, Panama, Greece, Ukraine, Ecuador and Saudi Arabia, the market saw further geographic expansion. This is especially welcome as all the new contestants are from Developing Markets (EM). Both Africa and LAC (Latin America and the Caribbean) had a solid year with the last arriving at record levels in issuance volume, the quantity of guarantors, and nation and backer decent variety. 2019 likewise observed the primary guarantor from the Caribbean: Williams Caribbean Capital, BBD3m ($1.5m). Supranationals gave a sum of USD13.7bn in 2019. While this speaks to 7% development contrasted with 2018, the expansion is by a long shot the littlest of the territorial orders. The biggest backers in this gathering were the European Speculation Bank, Asian Improvement Bank and European Bank for Remaking and Advancement, trailed by the World Bank (IBRD) and Global Money Organization.

The top three issuers of 2019 were:

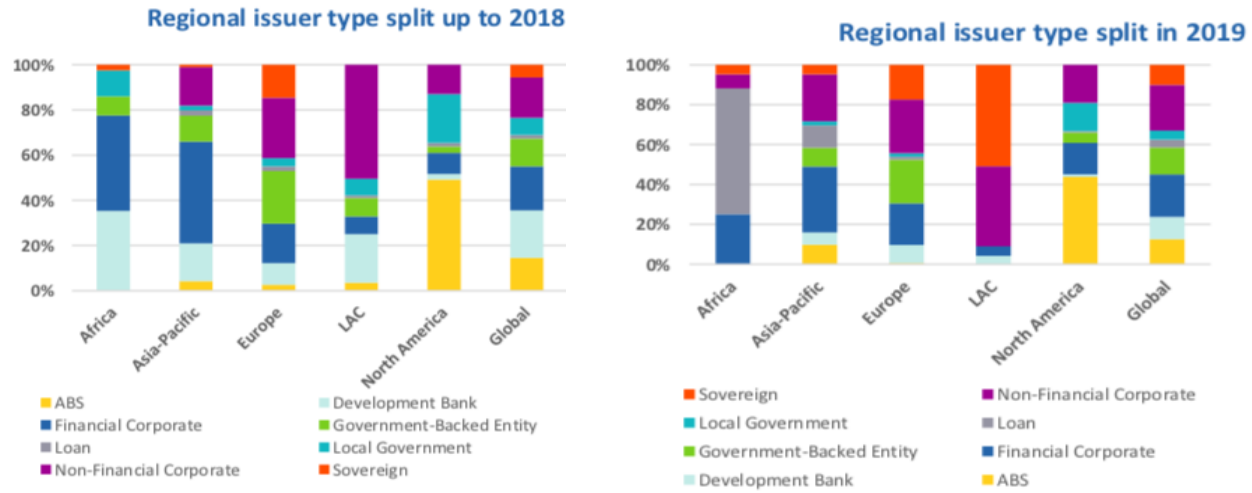
1. **Fannie Mae** - The pioneer of issuing agency Green Mortgage Backed Securities (MBS) which remained the biggest green bond issuer in 2019 with $22.9bn issuance (or 9% of the aggregate).
2. **KfW -** The German state-claimed development bank, was the second biggest issuer in 2019. It brought an aggregate of $9bn worth of green bonds to market. Continues will be utilized to give financing or co-financing to sustainable power sources and green structure ventures
3. The **Dutch State Treasury Agency** (DSTA) positioned as the third biggest issuer in 2019 with its $6.7bn debut green sovereign bond. The Certified Climate Bond meets the necessities of numerous sector rules and regulations under the Climate Bonds Standard, including: Low Carbon Buildings (Upgrades), Low Carbon Transport, Marine Renewable Energy, Solar, and Water Infrastructure.

At $45bn, certified issuance in 2019 flooded by 86% from $24bn in 2018, containing very nearly a fifth (17%) of worldwide volumes. The Netherlands Certified Sovereign Climate Bonds of €5.9bn/$6.7bn was both the biggest green obligation of 2019 just as the second biggest green bond gave to date. Together with other Confirmed bonds from ABN Amro, Obvion, Vesteda and De Volksbank, the Netherlands was the biggest wellspring of Guaranteed issuance in 2019 at $9.26bn

(or 20%). This was trailed by France with a sum of $9.17bn of certified issuance. Guarantors included SNCF which kept on financing the multi-billion rail and metro development in Paris alongside an aggregate of $5.1bn from others, for example, Société du Grand Paris, Société Générale and Akiem Group. Before the finish of 2019, total certified issuance under the Climate Bonds Standard came to $101.4bn, denoting a critical achievement for the worldwide affirmation conspire built up by the climate bonds initiative in 2011.

The 2019 Green Bond Market Summary published the 20th of February 2020 by the Climate Bond Initiative, sheds extra light on the distinctions and improvement of guarantor types profiles and the Use of Proceeds (UoP) blend for every locale. The distinctions are not just observable as far as both backer sorts just as UoP, however the scene is likewise advancing rapidly. Now and again, this appeared as stamped contrasts among 2019 and earlier years.

2.4.1.1 Regional Issuer type by region



Europe: money related, or also named financial, corporate issuance fell in 2019 contrasted to 2018 yet keeping up a level well over the total aggregate up to 2018. This proposes the portion is picking up noticeable quality in the area or region. Sovereign issuance additionally got over the most recent two years, and then mainly when looking at 2018. Generally speaking, the blend of type of issuers in Europe is reliably the most differed and adjusted but still most stable balanced of the districts.

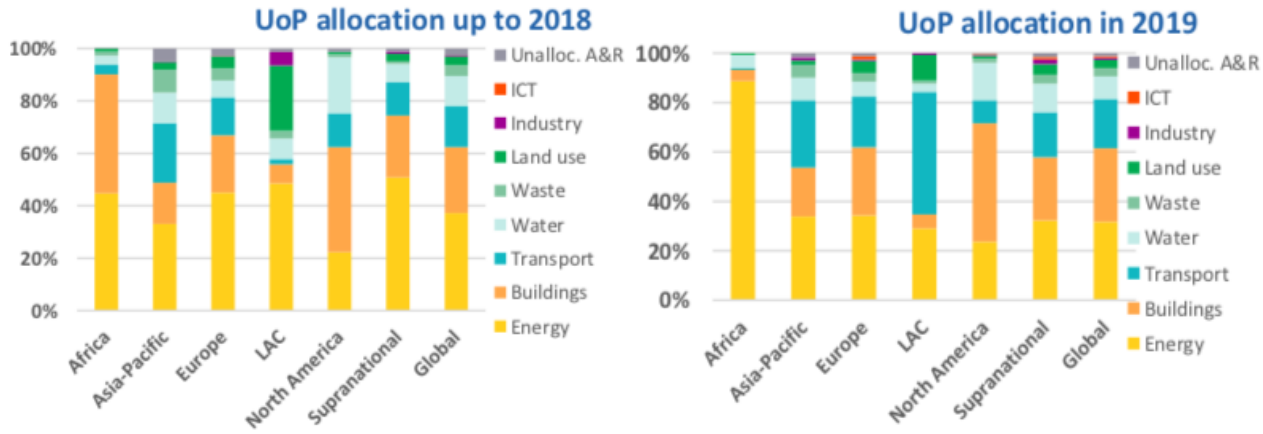
Asia-Pacific: The locale saw the blend changing with an expansion in non-budgetary corporate issuance in the year 2019, combined with an abatement in money related, financial corporate and development bank movement and or activities.

North America: The issuer mix was relatively unchanged, although corporates – both financial and non-financial – seem to be growing in share while local governments are dropping on a relative basis.

LAC: 2019 was an exceptional year given Chile's sovereign arrangements and agreements (the initial ones from the district), which commanded issuance volume. While the portion of non-budgetary corporates fell, their volume significantly increased from USD636m to USD1.9bn. Be that as it may, other guarantor types slacked in 2019. Accomplishing more noteworthy decent variety of backers will be a key target or better said aim for the district going ahead.

Africa: Totaling USD898m in 2019, Africa's market was ruled by the ZAR8bn (USD567m) venture loan to Redstone Solar Plant. In any event, when representing this, be that as it may, the blend changed significantly in 2019 with the rest of the issuance from corporates and the country's second green sovereign of Nigeria.

2.4.1.2 Use of Proceeds allocation by region



Europe: The designations and allocations of energy appear to have balanced out underneath the combined aggregate up until 2018, having dropped from 45% in that period to 34% in 2018 and 2019. Then again, the structures also known as the Buildings and Transport each grew six percentage points in 2019 versus 2018.

Asia-Pacific: A considerable increment was found in Buildings and Transport allotments in the course of the most recent two years, by Chinese issuers driven forces by investing in assets and projects in these categories. Then again, in Water and Waste infrastructure frameworks it was notable that it fell both in 2018 just as further in 2019.

North America: In the year 2019, Buildings kept on developing in share, speaking to practically half (48%) of distributions, while Transport and Water dropped particularly underneath the aggregate up to the year 2018. Contrasted or when put together with the other different areas, North America stands apart as the one in particular where Energy is not the most subsidized classification, and among created advanced markets, with a lot of smaller designations and allocations to Transport, Waste, Land Use, Industry and ICT.

LAC: The blend in 2019 was completely and totally different driven by the move to Transport because of Chile's sovereign deals. After passing a few years, supported by issuance from paper and ranger service organizations (particularly from Brazil), assignments to Land Use have fallen over the most recent two years, especially in the year 2019. This is certain, as it shows developing segment decent variety among green bond issuers; more negative is the falling portion of Industry, which according to our hopes and expectation will recuperate in the coming years.

Africa: The year 2019 was an exceptional year, with a large portion of distributions to Energy – dominated by Redstone SolarPlant's debut bargain, which financed solar energy generation resources in South Africa. Be that as it may, Africa's low issuance volume is normally dependent upon huge movements and we will keep on checking this subject. Until further notice, it is consoling to see a more noteworthy assortment of benefits and undertakings beginning to get subsidized

Supranationals: Among the Supranational substances, the most observable pattern is the declining portion of Energy assignments. Then continues coordinated to most different classes, to be specific, the Transport, Water and Waste, have expanded significantly. This is an invite that proposes Multilateral Development Banks (MDBs) to have the option to broaden the activities and associations they support themselves.

2.4.2 Green indices as a sign of market growth

As the market rapidly scales, indices are playing an important role in breaking down some major barriers facing institutional investors in the past: a lack of understanding of the types of green bonds and a lack of clear risk and performance data about them.

Starting from March 2014, several ratings agencies and financial institutions have created indices to exclusively cover green bonds. One of them was Solactive, which launched the first green bond index, followed in July by S&P with their S&P Green Bond Index and the S&P Green Project Bond Index. Bank of America Merrill Lynch came third creating their own index in October. A month later, MSCI launched group of green bond indices in cooperation with Barclays. The creation of various types of green bond indices can be seen as a signal of a market which is increasing in size and demand, gaining more and more attention from institutional investors.

Solactive Green Bond Index is a rules-based, market value weighted index engineered to mirror the green bond market. The index is calculated as a Total Return Index denominated in USD.

Eligibility criteria:

- Weighting: Market Value weighted with the maximum weight capped at 5% per bond
- Calculation: Calculated as Total Return Index denominated in USD
- Green Criteria: Bonds must be flagged as "green" by Climate Bonds Initiative (CBI)
- GBP/CBI alignment: Aligned to CBI
- Amount Outstanding: Of at least USD 100m
- Maturity: At least 6 months until Final Maturity
- Exclusion: Inflation linked bonds, convertible bonds, municipal bonds, ABS/MBS and other structured securities
- Index Rebalanced: Monthly basis at the end of each month, 5 working days before month end

Current constituents of the index: As at May 03 2020	727

1. **The S&P Green Bond index and the S&P Green Bond Select index** are multi-currency benchmarks that include bonds issued by multilateral, government and corporate issuers. It includes only those bonds whose proceeds are used to finance environmentally friendly projects. The S&P Green Bond Index was developed collaboratively by S&P Dow Jones Indices and Infrastructure Credit Alpha Group LLC. The S&P Green Bond index is market-value-weighted and the S&P Green Bond Select index is modified market-value- weighted – issuers are capped at 10% and the High Yield Portion is capped at 20%.

   Eligibility criteria:

   - Sector: Corporate, government, and multilateral are eligible for the Green Bond Index;
   - Issuer Disclosure: In order for a bond to be eligible, the issuer must clearly indicate the bond's 'green' label and the rationale behind it, such as the intended use of proceeds. Such disclosure must be made in sources that are credible and related to the company and may include company's website, sustainability report, legal disclosures, public filings or independent second opinions;
   - Currency: May be issued from any country and in any currency (S&P Green Bond Index). Must be issued in G10 currencies or global markets (S&P Green Bond Select Index);
   - Green Criteria: Bonds must be flagged as "green" by Climate Bonds Initiative (CBI);
   - Pricing: Prices are obtained from Thomson Reuters and Securities Evaluation/ICE Data Services;
   - Credit Quality: Has no credit requirements (S&P Green Bond Index). It only includes bonds with an investment level that uses the average rating of Moody's, S&P and Fitch (S&P Green Bond Select Index);
   - Coupon Type: Includes Fixed, Zero, Step-up, Fixed-to-Float, Floaters (S&P Green Bond Index); Includes Fixed, Zero, Step-up, Fixed-to-Float (S&P Green Bond Select Index);
   - Maturity: Each bond must have a maturity greater than or equal to one month from the rebalancing date. No bond matures in the index;

- Optionality: Bullets, callable, puttable, and callable-perpetual are included (S&P Green Bond Index); Bullets, callable, and puttable are included (S&P Green Bond Select Index);
- Settlement: Bonds that are issued but not settled prior to the month-end rebalancing are included in the index;
- Data Source: Data is obtained from Thomson Reuters and Securities Evaluation/ICE Data Services
- Monthly Rebalancing: Based on new issuance and maturity, the bonds in the index are subject to change every month, effective after the close of the last business day of the month
- Exclusions: Bills, Inflation-linked and STRIPS (S&P Green Bond Index); Bills, Inflation-linked and STRIPS, Sukuk, Convertible, Private Placement with no registration, Floaters, Perpetual, and Tax-Exempt Municipal Bonds (S&P Green Bond Select Index);

Current constitution and performance: As at May 01 2020	**S&P Green Bond Index**	**S&P Green Bond Select Index**
Constituent Count	6437	555
Market Value Outstanding (USDmm)	613,334.39	419,808.82
Yield to Worst	1.46%	1.22%
Yield to Maturity	1.51%	1.23%
Weighted Average Maturity	10.70 Yrs	12.16 Yrs
Modified Duration	6.80	7.68

2. **BAML Green Bond Index** is designed to track the performance of debt issued by quasi-governments and corporations where the proceeds of the issue are to be used solely for projects and activities that promote climate or other environmental sustainability purposes.

Eligibility criteria:

- Sector: Includes debt of corporate and quasi-government issuers, but excludes securitized and collateralized securities
- Currency/issue size: Qualifying emerging markets currencies are selected annually and fixed minimum issue sizes are set for each. Currently qualifying currencies/minimum issue sizes are:
    - ❑ Developed market currencies: AUD 100; CAD 100; EUR 250; GBP 100; JPY 20,000; SEK 1,250; and USD 250;
    - ❑ Emerging market currencies: BRL 150; CLP 50,000; CNH 500; CNY 500; COP 200,000; CZK 2,000; EGP 500; HKD 750; HUF 20,000; IDR 1,000,000; ILS 300; INR 5,000; KRW 100,000; LKR 40,000; MAD 750; MXN 1,250; MYR 300; NGN 15,000; PEN 250; PHP 4,000; PLN 300; RON 300; RUB 3,000; SGD 100; THB 3,000; TRY 150; TWD 3,000; VND 2,000,000; and ZAR 750;
- Green Criteria: Qualifying bonds must have a clearly designated use of proceeds that is solely applied toward projects or activities that promote climate change mitigation or adaptation or other environmental sustainability purposes. General debt obligations of corporations that are involved in green industries are not included.
- GBP/CBI alignment: not explicit
- Credit Quality: Includes only investment-grade bonds based on an average of Moody's, S&P, and Fitch
- Coupon Type: Includes securities with a fixed coupon schedule. Also, includes fixed-to-floating rate securities provided they are callable within the fixed rate period and are at least one month from the last call prior to the date the bond transitions from a fixed to a floating rate security.
- Maturity: At least 18 months to final maturity at the time of issuance, at least one-month remaining term to final maturity as of the rebalancing date
- Index Rebalanced: Monthly on the last calendar day of the month
- Currency Rebalanced: Qualifying emerging markets currencies are selected annually on June 30th, and any resultant changes are implemented on the September 30th rebalancing

- Qualifying Bond: Zero Coupon Bonds; Pay in kind securities (including toggle notes); Callable perpetual securities (at least one year from call date); Capital securities where conversion can be mandated by regulatory authority; Hybrid capital securities.
- Excluded Bonds: Contingent capital securities ("cocos"); Municipal securities; Inflation linked securities; Equity Linked securities; Legally defaulted securities.

Historical Performance and Statistics: As at 30 April 2017 (latest available)

Currency	%	Quality	%
EUR	58%	Aaa	38%
USD	33%	Aa	17%
GBP	3%	A	26%
Other	6%	Bbb	17%

BofAML Global Green Bond Index	Full Market Value	Bonds Included	Mod. Duration to Worst	Yield to Worst
	$109bn	167 bonds	5.60 Yrs	1.44%

3. **Bloomerang Barclays MSCI Green Bond** is a multi-currency benchmark that includes local currency debt markets tracked by the Barclays Global Aggregate Index.

   Eligibility criteria:

   - Sector: Corporate, government-related, treasury and securitized bonds are eligible for the Green Bond Index
   - Currency: Multi-currency benchmark that includes local currency debt markets tracked by the Bloomberg Barclays Global Aggregate Index. USD-only and EUR-only Green Bond Indices are also available as flagship benchmarks

- Green Criteria: To be assessed against six MSCI defined eligible environmental categories.
- Green Criteria-detail: To be classified as a green bond, a security's use of proceeds must first fall within at least one of six MSCI defined eligible environmental categories: alternative energy, energy efficiency, pollution prevention and control, sustainable water, green buildings, and climate adaptation (see more detail below). General-purpose bonds are eligible if 90% of the issuer's activities (as measured by revenues) fall within one or more of the eligible MSCI environmental categories. Further, an eligible green bond's prospectus or supporting documentation must clearly identify the specific criteria and process for determining eligible projects or investments, and a formal process to ring-fence net proceeds must be disclosed in the bond prospectus or supporting documentation. At issuance, the issuer must either report on eligible projects or state its commitment to report within one year of issuance. Reporting will be monitored, and bonds can be removed if the issuer fails to report at least annually, or if annual reporting indicates that over 10% of proceeds had been used for ineligible projects.
- GBP/CBI Alignment: Not explicit, MSCI ESG Research green criteria are broadly aligned with GBP
- Amount Outstanding: Fixed minimum issue sizes are set for all local currency markets matching Bloomberg Barclays Global Aggregate Index. (USD 300m, CAD/EUR/CHF/AUD 300m, GBP 200m, JPY 35bn, SEK 2.5bn, CZK/THB 10bn, NZD/SGD 500m, CLP 100bn, KRW 500bn, HKD/DKK/NOK/PLN/ZAR/ILS/MYR 2 bn)
- Credit quality: Securities must be rated investment grade (Baa3/BBB-/BBB- or higher) using the middle rating of Moody's, S&P and Fitch; when a rating from only two agencies is available, the lower is used; when only one agency rates a bond, that rating is used
- Coupon Type: Includes fixed-rate securities only
- Maturity: Does not have a 1-year minimum time to maturity and holds bonds until final maturity
- Index Rebalanced: MSCI ESG Research picks up newly issued bonds throughout the month and evaluates each bond's documentation for eligibility against the index criteria. About the evaluation process, the formal list of green bonds evaluated by

MSCI ESG Research is updated on the 25th calendar day of each month. A technical note is released indicating the bonds to be added and provides justifications for any labeled green bonds considered ineligible, under review, or on watch for removal. Index is rebalanced on the last business day of each month

- Reporting:
  - ❏ At Issuance: issuer reports on specific projects to be financed by the proceeds of the bond, or commitment to report on Use of Proceeds in twelve months' time.
  - ❏ Ongoing: List of specific projects/investments, including amount disbursed to each individual project, or list of aggregate projects/investment categories, including amount disbursed to each category, or qualitative or quantitative environmental impact on the project pool (i.e. ex-ante estimates, ex-post results). Ongoing reporting is reviewed at least annually until the bond reaches maturity OR until net proceeds have been disbursed
- Exclusion: Bond may be removed if Use of Proceeds are not meeting criteria or if there is no reporting to support Use of Proceeds:
  - ❏ +15 months of issuance, bond will be placed 'on watch' in green bond technical note if not reporting is available
  - ❏ +18 months of issuance, bond will be removed from index if reporting is still not available.

Current constitution: As of 29 Dec 2017 (latest available)

Sector	%	Currency	%	Quality	%
Government Related	60%	EUR	58%	Aaa	33%
Corporates	32%	USD	33%	Aa	24%
Treasuries	7%	GBP	3%	A	23%
Securitized	1%	Other	6%	Baa	20%

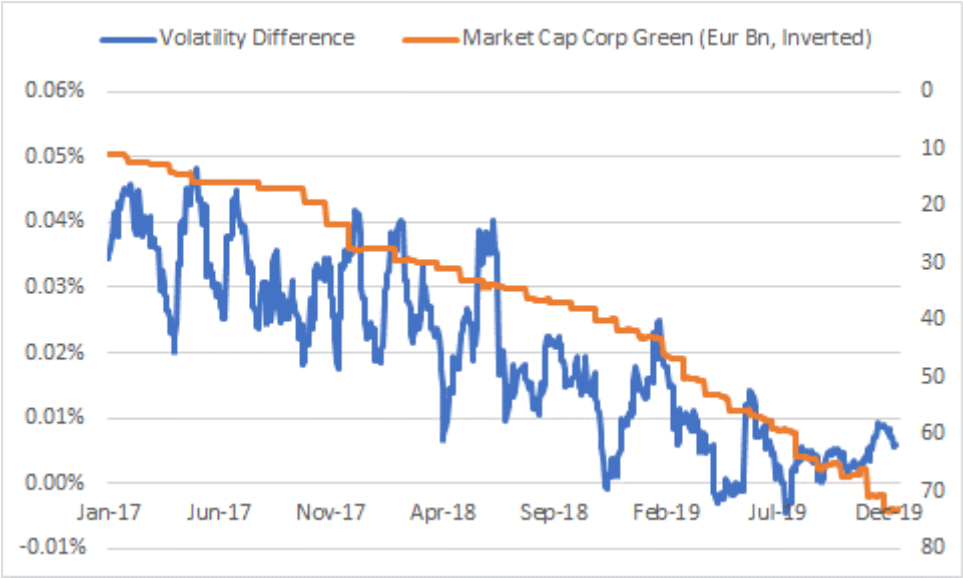
	Number Issues (Returns)	Market Value (MM)	Duration (Mod.Adj.)	Maturity	Yield to Worst
Global Green Bond Index	216	171913	7.14	8.47	1.52
Euro Green Bond Index	102	99534	8.45	9.13	0.71

Green bond indices have, in general, performed better than traditional indices over the past four years according to NN Investment Partners, the Dutch fund manager. This performance was possible to be calculated by following the evolution of the performance of euro green bond indices to regular indices since 2016. The study, made in February 2020, found that in 2019 the Bloomberg Barclays MSCI Euro Green Bond Index returned 7.4%, performing better than the 6% of the Bloomberg Barclays MSCI Euro Aggregate Index of regular euro-denominated corporate and sovereign bonds. Euro green bonds outperformed for three of the last four years, by an average of 0.7% per year.

Source: Bloomerang, data as 10th of May 2019

“The annual volatility of the green bond index was higher for three of these years, this means that the higher returns were largely the result of higher risk”, said Bram Bos, lead portfolio director green securities at NN IP. It was shown that the term of the Bloomberg Barclays MSCI Euro Green Security File increased in size in mid 2017 when the Republic of France issued its first green

government security for €7 billion ($7.6bn) and with a 22-year development. The higher term implies green securities are increasingly touchy to loan fee changes. As loan fees fell a year ago, the Bloomberg Barclays MSCI Euro Green Bond File outflanked the Bloomberg Barclays Euro Total List. NN IP likewise found that the instability of the corporate green security list has been drawing nearer to the customary security record. “This shrinking volatility differential means that the barriers to replacing a portfolio of traditional corporate bonds with a portfolio of corporate green bonds have also diminished,” included the examination. Given the solid disparity in yearly unpredictability, NN IP likewise thought about the day by day instability of these two corporate security files in the course of recent years (figure beneath). The blue line demonstrates that the thing that matters is inclining reliably descending, implying that, as far as unpredictability, the green and non-green files are moving towards one another. NN IP accepts the purpose behind this union is the development (appeared on the correct hub) and expanded enhancement of the corporate green security advertise. The term of the two files is currently practically equivalent.



Looking at Bloomberg Barclays MSCI Euro Green Security file: Corporate to the Bloomberg Barclays MSCI Euro Total Corporate record was discovered that in 2019, corporate green securities booked returns of 6.4% contrasted with 6.2% for ordinary corporate securities, and beat in three of the four years – 2016, 2018 and 2019. The exhibition of green bonds was likewise examined by Amundi Resource The board who found that ESG (Environmental, Social, Governance) contributing is a wellspring of outperformance for speculation grade bonds from European backers, however the inverse for American guarantors. Alban de Faÿ, head of socially capable venture fixed pay forms at Amundi, said in an announcement: “Contrary to common ideas, ESG investing may

generate performance in euro investment grade bonds. In the case of US dollar investment grade bonds, ESG investing is penalized. But we are beginning to see the light, as the cost of ESG investing has been dramatically reduced these recent years." Amundi additionally found that guarantors with higher ESG scores have lower cost of capital than backers with lower ESG scores for a similar FICO assessment.

2.4.3 What's in the near future under Covid-19 pandemic

In the market disturbance of the previous weeks it has been noticeable that the Green Bonds have been doing and holding admirably in the market strife. The Intercontinental Exchange (ICE) BofA Green Bond Index lost 5% in complete return between the finish of February and March 20, while the more extensive ICE BofA Global Corporate Index was down 11%. A lot of this outperformance down to the cautious nature and higher evaluations of the constituents of the Green Bond Index contrasted and its corporate partner: the previous incorporates a noteworthy number of industrials and utilities. Obviously, UBS expert Thomas Wacker says his group anticipates green securities: "To exhibit lower volatility and smaller drawdowns compared to non-green bonds during periods of market stress." Just $1.8 billion in green securities was propelled in March as per the Climate Bonds Initiative. That is fundamentally lower than in February and January, which each enlisted over $15 billion in issuance. "We're still seeing frequent issuers accessing the market" says Cristina Lacaci, head of green and manageability securities at Morgan Stanley, "but we do expect a slower pace in the short term with a pick-up later in the year."

While green bonds might be somewhat quieted, issuance of social bonds and sustainability bonds, different sorts of bonds instruments where the returns will be solely applied to qualified natural as well as social activities, is ticking upwards. As indicated by information from BNP Paribas, social bond issuance came to $8.1 billion toward the finish of March of this year, outperforming the $5.2 billion of the same time last year. This year sustainability bond issuance has been larger than twofold of 2019 results, amounting to $15.97 (2020) billion against the $7.28 billion (2019). "Last year, the breakdown between green and social bonds was about 80/20 – as of now it is about 60/40. This is a trend that will be important in the following weeks and months," says Tejada. The Universal Capital Market Affiliation lately has released guidelines pointing out the way that social securities could help in the course of the pandemic. Among qualified social projects it recorded as closely related to the coronavirus pandemic, medicinal services and clinical examination, interest in

extra clinical hardware, fabricating offices to create wellbeing and security gear and cleanliness supplies, just as explicit activities intended to mitigate joblessness produced by the emergency. While apparently social securities could at this time outpace green security issuance in the following months, Susan Barron, worldwide head of green and practical capital markets at Barclays, says that there isn't rivalry between the items. “People forget that green, social and sustainability bonds are very complementary. You won’t find a green bond that has an adverse impact socially, for example. Nor will you find a social bond that is detrimental to the environment. The two have outcomes that work towards the same broader goals.”

CHAPTER 3: Hera Group

Hera Group is an Italian multi-utility leader in environmental, water and energy services. It was born in 2002, out of the aggregation of 11 Emilia-Romagna municipal companies, making Hera (Holding Energia Risorse Ambiente) the first corporation of its kind nationwide. It has embarked on a journey of consistent and balanced growth, incorporating other companies active in the same areas, committing to sustainability in the national and international networks. In fact, Hera Group was included to the CE100 programme of world's leader in circular economy, Ellen MacArthur Foundation, as the second Italian company to join it ever. The program aims at supporting issues associated to the circular economy, exchange experiences, initiate projects in partnerships and cooperate in the field of research and development. Hera is also part of the Circular Economy Network, a project promoted by the Sustainable Development Foundation, companies and associations involved in the transition to a new model of circular economy. The Group, headquartered in Bologna, is publicly listed since 2003 in Piazza Affari and is now among the nation's largest multi-utilities, covering important roles as:

1° in Environmental services: 7.2 mln/ton of wasted handed, 3.3 min citizens served, 2mln/ton urban waste collected;

2° in the Integrated Water Cycle:289.3 mln/$m^3$of water sold, 3.6 mln citizens served, 35,359 km of water network;

3° in gas distribution: 3.0 bln/m^3 of gas distributed, 2mln citizens served, 20.901 km of gas network;

4° in the Sale of Electricity: 12.8 TWh of electricity sold, 1.3 mln customers served, 12,602 km of electricity network.

Hera offers also other services as public lighting and telecommunications. Its range of activities undergoes continuous and constant development and reflects the five levers on which the Group's strategic orientation is founded: growth, efficiency, excellence, innovation and agility. Hera Group's leadership is represented by the 9000+ employees who meet the needs of 4.3 mln citizens in 330 municipalities in Emilia-Romagna, Veneto, Friuli-Venezia Giulio, Marche and Tuscany.

3.1 The second new Green Bond of Hera

Hera Group, after having been the one to make the first step onto the green finance issuing the first Italian green bond in 2014, it is keeping up its central role towards sustainability, issuing its second corporate green bond in July 2019. The features of Hera's new issuance are as follows:

- **Type**: Straight
- **Issued amount (€)**: 500 million
- **Issue Price**: 98.407%
- **Interest basis**: 0.875% fixed rate
- **Rating S&P's**: BBB
- **Rating Moody's**: Baa2
- **Coupon date**: 05/07
- **Maturity date**: 05/07/2027 (8 years)
- **Interest Accrue date**: 05/07/2019
- **Yield to maturity**: 1.084%
- **Listing**: Irish Stock Exchange, Luxembourg Stock Exchange, ExtraMOT PRO
- **Joint bookrunners**: BNP Paribas, Crédit Agricole Corporate and Investment Bank, Mediobanca - Banca di Credito Finanziario S.p.A, UniCredit Bank AG
- **Bookrunner**: BBVA

There has been a high interest from international investors (France Germany, United Kingdom and the Netherlands) towards the new green debt security issued by Hera, which received a strong demand, seeing subscriptions reaching seven times the amount offered. Thanks to the quality of the orders received, the price has been able to be fixed at an excellent level. The bond, besides being listed on Irish Stock Exchange and Luxembourg Stock Exchange, it is listed also on the Borsa Italiana segment dedicated to green and/or social bond called ExtraMOT PRO. This segment was created to offer to both institutional and retail investors the possibility to identify the instruments dedicated to finance projects with specified benefits towards environmental and social matters. Adding the new bond issued by the Hera Group, the list of securities for sustainable development on the bond markets of Borsa Italiana increases of another corporate issue, reaching 83 listed instruments since the birth of the segment.

3.1.1 Green Financing Framework

“Green financial instruments or ESG are a fundamental lever to support the effort that Hera Group is putting to attain a more regenerative and resilient business model, in order to achieve the objectives listed on the Agenda Onu 2030 and give answers to the several challenges we are facing with, starting from climate change which needs innovative solutions and long term investments. The green bond that we have issued is strictly in this direction and for these purposes.”

-Stefano Venier, CEO Hera

The Green financing framework is the policy document prepared by Hera that defines the categories of green projects, the project selection process and the criteria used for the selection, the process of managing the funding received, and the commitments in terms of reporting and external verification. Hera Group is among the first companies in Europe to have provided itself with the “framework” and it is in line with the GBP published by the ICMA in 2018 and the Green Loan Principles published by Loan Market Association (LMA) in December 2018. The green projects used by Hera aim to achieve five environmental objectives: climate change mitigation, adaptation to climate change, conservation of natural resources, preservation of biodiversity and prevention and control of pollution; this projects can be financed by various types of green financing instruments, in line with the Green financing framework, including:

- Green bonds;
- green loans, including, for example, term loans, project finance loans, asset finance, and revolving credit facilities;
- any other financial instrument for financing green projects.

Eligible green projects may include new, ongoing or existing projects, as long as they are financed no more than two years before each green financing instrument is issued.

The net proceeds from the issuance of the green bond 2019 will be used to finance and/or refinance several projects, new or already implemented, in compliance with the Eligibility Criteria, which are included in the Business plan to 2022, that pursue one or more of the goals in the UN’s 2030 Agenda. These projects have been subdivided into 3 categories and are described in the table below:

Eligible categories	Description of the eligible green projects	Environmental goals	Contribution to the UN SDGs
Energy efficiency and electricity infrastructures, district heating and public lighting	● Improvement of the lighting, heating and insulation of private and public buildings ● Smart network for distributed energy generation and climate change adaptation ● Smart meters ● district heating networks ● Public lighting and smart cities ● Charging station for electric mobility ● High efficiency cogeneration and combined heat and power generation	● Increase of energy and electricity infrastructures, district heating and public lighting generated from non-fossil fuels ● Contribution to the mitigation of climate change	SDG 7: Clean and accessible energy SDG 13: Fight against climate change
Circular economy and sustainable waste management	● Municipal waste collection systems: separate collection centres, bins and containers for separate collection, quantity-based tariff projects, vehicles for separate waste collection ● Facilities and installations for the recycling of materials (plastic, glass, etc.) and improvements in the sorting of waste ● Waste-to-energy treatment ● Biological and chemical treatment and other waste treatment plants	● Increase of separate waste collection and reduction in waste disposed of in landfills ● Contribution to the mitigation of climate change	SDG 12: Responsible consumption and production
Sustainable management of the water service	● Type of projects: purification, sewage and water infrastructure for resilience and adaptation to climate change	● Improvement to wastewater treatment plans ● Contribution to the mitigation of climate change	SDG 6: Clean water and sanitation services SDG 14: Life under water

3.1.2 Second Party Opinion

The SPO was taken care by ISS-oekom Corporate Solution, one of the world's leading rating agencies in the field of sustainable investment. It analyses companies and countries regarding their

environmental and social performance, providing support to issue sustainable bonds, advising them on the selection of categories of project to be financed, defining ambitious criteria. The agency assesses the alignment with external principles, as ICMA Green Bond Principles, review the sustainability performance of the issuer and analyze the sustainable quality of the assets. Drawing the SPO, it allows to keep investors well informed about the quality of the bond from a sustainability perspective.

ISS-oekom assessed the contribution of the Green Bond issued by Hera to the UN Sustainable Development Goals (SDGs), giving as result that:

• it has a *limited contribution* to 7 "Affordable and clean energy" and 13 "Climate Action" thanks to its Use of Proceeds categories promoting clean energy generation and efficient distribution;

• it has a *significant contribution* to 12 "Responsible consumption and production" and a *limited contribution* to 7 "Affordable and clean energy" and 13 "Climate Action" thanks to its project categories contributing to Circular Economy & Sustainable Waste Management;

• it has a *significant contribution* to 6 "Clean water and sanitation" and 7 "Affordable and clean energy, and a *limited contribution* to 3 "Good health and well-being" thanks to its Use of Proceeds category of Water Infrastructure.

3.1.2.1 Reporting

Transparency is one of the main characteristics that distinguishes green bonds from no green ones and Hera, to assure its investors, will report on the allocation of net proceeds and correlated environmental benefits every year until the proceeds of each Green Finance instrument issued has been fully allocated. The multi-utility company will report also, if necessary, in the event of material development or in case of change of project.

A. **Allocation reporting**
   - ➔ The aggregated amount of Green Financing instruments issued by type (i.e. Green Bond, Green Loan)
   - ➔ For each Green Financing:

- The aggregated amount of allocation of the net proceeds to the Eligible Green Projects (at category level), with a description and selected case studies
- The balance of any unallocated proceeds invested in cash or other liquid marketable instruments
- The proportion of net proceeds used for financing versus refinancing

B. Impact reporting

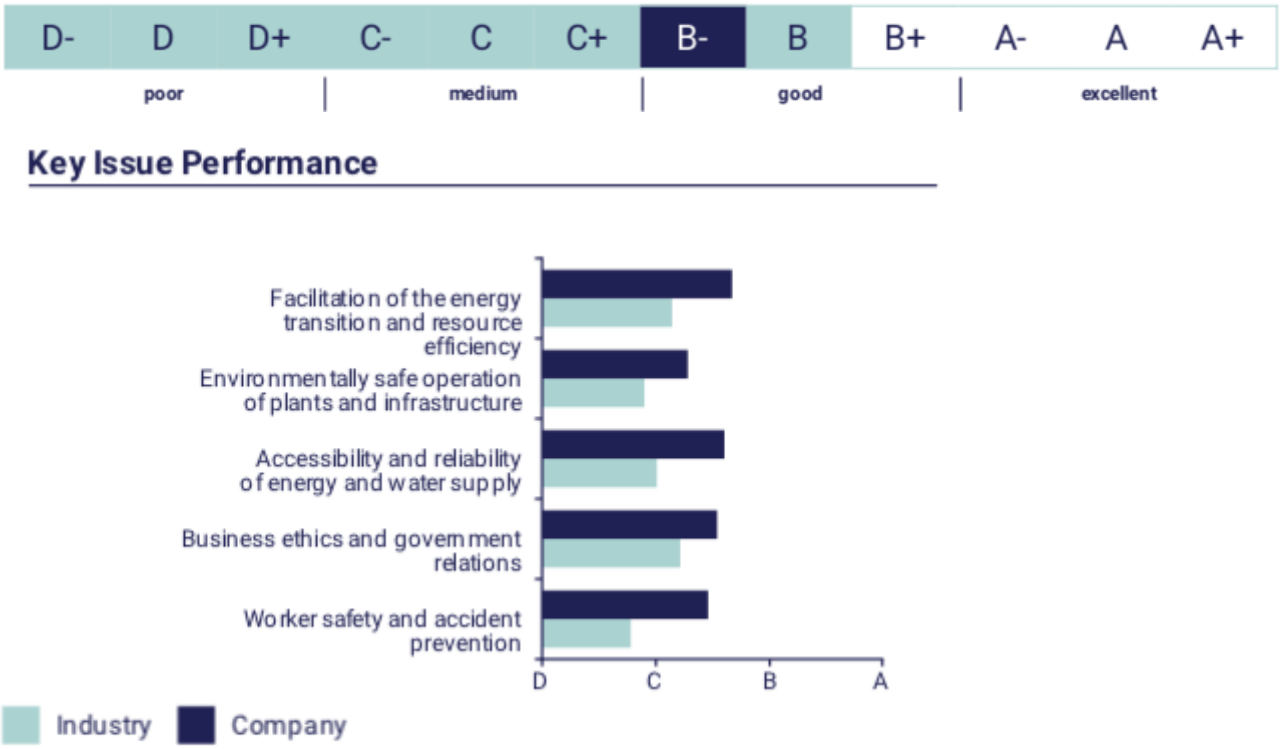
Hera will report on a number of environmental impact metrics associated with the Eligible Green Projects funded with the net proceeds of each Green Financing. It follows examples of KPIs (comparison with last year investments) are illustrated below:

ELIGIBLE CATEGORY	EXAMPLE OF KPIS FOR REPORTING WHERE APPLICABLE
Energy Efficiency and energy infrastructure	▪ Energy saved (toe) ▪ GHG emission avoided (tCO2e) ▪ Network length (km) ▪ Number of event of interruption by client (n) ▪ Installed Smart meters (n) ▪ Served Citizens/Points of grid distribution (POD, PDR) ▪ Public lighting points with Led technology
Circular economy & Sustainable Waste Management	▪ Recycled plastic sold (ton) ▪ GHG emission avoided (tCO2e) ▪ Atmospheric emissions reduction with respect to legal limits (%) ▪ Heat energy, biomethane and electricity produced from waste treatment (MWh) ▪ Treated waste (ton) ▪ Separated/Sorted collection of waste (%) ▪ Waste sent for the recovery of material (%)
Water infrastructure	▪ Served citizens (n) ▪ Network length (km) ▪ Water fed in the network by source (mc) ▪ Water distributed using tanker trucks (mc) ▪ Quality of the waste-water in compliance with regulatory limits (%) ▪ Urban areas compliant with law regarding waste-water treatment (%)

3.1.2.2 Ratings

ISS-oekon gave to Hera a “Prime” status, ranking it with a B-, placing the company 6th out of the 43 companies rated by the former in the Utilities/Multi-utility sector. As the key issue performance graph shows, Hera Group performs much better than the average of its industry, in fact the rating

received means the company performed well in sustainability, both compared to its competitors in the same field and in terms of industry-specific requirements defined by ISS-oekom. For the latter, the securities issued by the company therefore all meet the basic requirements for sustainable investments.



Given the Key Challenges which face companies in terms of sustainability management in the Utility/Multi-utility sector:

- Facilitation of the energy transition and resource efficiency;
- Environmentally safe operation of plants and infrastructure;
- Accessibility and reliability of energy and water supply;
- Business ethics and government relations;
- Worker safety and accident prevention;

Hera rates above the average in all key issues, but it achieved a very significant outperformance in "Accessibility and reliability of energy and water supply".

Talking about the controversy, which is defined by Société Générale as "*when a company's activity has unintended and/or undesired negative environmental and/or social effects on stakeholders, with corresponding reputational risk*"6, Hera Group has a minor controversy level (-2) compared to the

sector which is classified as “severe” with a max controversy score of -35. Minor controversies were identified to anti-competitive behavior in Italy and energy generation based on natural gas.

CONCLUSION

This research paper wants to highlight how awareness towards environmental matters have progressed within the years. The innate will of humans to discover and develop, having as consequences technology evolution, easier life and exponential increase of population, has always been based on the exploitation of natural resources. It is clear how unsustainable humankind's habits are and thanks to the researches made in the field, nowadays we have a clear scenario which shows what path to take in order to avoid the irrecoverable damages that would put at stake our thrive on Earth. Governments, finance and entrepreneurship have a fundamental role to reach a sustainable growth, pledging for greener choices, acting as a model for today and tomorrow's generations. To reach solid goals in the fight against climate change, a common commitment is needed, starting from our everyday life choices to political, financial and entrepreneurial ones. This research paper have shown the increasing in performance and issuance of Green Bonds and other sustainable investment instruments, proving that the green finance is on the right track, with many new investors joining the common goal of diminishing carbon emissions by financing green projects. Nowadays costs of technologies for renewables have also decreased seeing renewables generation capacities increasing substantially year after year. This demonstrates that if there is a global focus on the subject, with international cooperation and consistency, the temperature objectives set at the Paris agreement could be met, but radical innovations that would change our habits are needed.

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