

# Forestry\* Criteria

## Development of Eligibility Criteria under the Climate Bonds Standard & Certification Scheme

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\* These Criteria also cover the  
conservation and restoration of non-forested land

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## Definitions

**Climate Bonds Initiative (CBI):** An investor-focused not-for-profit organisation, promoting large-scale investments that will deliver a global low carbon and climate resilient economy. The Initiative seeks to develop mechanisms to better align the interests of investors, industry and government so as to catalyse investments at a speed and scale sufficient to avoid dangerous climate change.

**Climate Bond:** A climate bond is a bond used to finance – or re-finance - projects needed to address climate change. They range from wind farms and solar and hydropower plants, to rail transport and building sea walls in cities threatened by rising sea levels. Only a small portion of these bonds have been labelled as green or climate bonds by their issuers.

**Certified Climate Bond:** A Climate Bond that is certified by the Climate Bonds Standard Board as meeting the requirements of the Climate Bonds Standard, as attested through independent verification.

**Climate Bonds Standard (CBS):** A screening tool for investors and governments that allows them to identify green bonds where they can be confident that the funds are being used to deliver climate change solutions. This may be through climate mitigation impact and/ or climate adaptation or resilience. The CBS is made up of two parts: the parent standard (Climate Bonds Standard v2.1) and a suite of sector specific eligibility Criteria. The parent standard covers the certification process and pre- and post-issuance requirements for all certified bonds, regardless of the nature of the capital projects. The Sector Criteria detail specific requirements for assets identified as falling under that specific sector. The latest version of the CBS is published on the Climate Bonds Initiative website

**Climate Bonds Standard Board (CBSB):** A board of independent members that collectively represents \$34 trillion of assets under management. The CBSB is responsible for approving i) Revisions to the Climate Bonds Standard, including the adoption of additional sector Criteria, ii) Approved verifiers, and iii) Applications for Certification of a bond under the Climate Bonds Standard. The CBSB is constituted, appointed and supported in line with the governance arrangements and processes as published on the Climate Bonds Initiative website.

**Climate Bond Certification:** allows the issuer to use the Climate Bond Certification Mark in relation to that bond. Climate Bond Certification is provided once the independent Climate Bonds Standard Board is satisfied the bond conforms with the Climate Bonds Standard.

**Green Bond:** A Green Bond is where proceeds are allocated to environmental projects. The term generally refers to bonds that have been marketed as “Green”. In theory, Green Bonds proceeds could be used for a wide variety of environmental projects, but in practice they have mostly been the same as Climate Bonds, with proceeds going to climate change projects.

**Technical Working Group (TWG):** A group of key experts from academia, international agencies, industry and NGOs convened by the Climate Bonds Initiative. The TWG develops the Sector Criteria - detailed technical criteria for the eligibility of projects and assets as well as guidance on the tracking of eligibility status during the term of the bond. Their draft recommendations are refined through engagement with finance industry experts in convened Industry Working Groups and through public consultation. Final approval of Sector Criteria is given by the CBSB.

**Industry Working Group (IWG):** A group of key organisations that are potential issuers, verifiers and investors convened by the Climate Bonds Initiative. The IWG provides feedback on the draft sector Criteria developed by the TWG before they are released for public consultation.

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The Climate Bonds Initiative gratefully acknowledges the Technical and Industry Working Group members who supported the development of these Criteria. Members are listed in Appendix 1. Special thanks are given to Dr. Christine Negra, the lead specialist coordinating the development of the Criteria through the Technical Working Group.

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# 1 Introduction

## 1.1 Overview

This Background Document serves as a reference document to the Criteria Document for Forestry Criteria. The purpose of the Background Document is to provide an overview of the key considerations and issues that were raised during development of the Forestry Criteria.

The Criteria are developed through a consultative process with Technical Working Groups (TWGs) and Industry Working Groups (IWGs), and through public consultation. The TWGs comprise academic and research institutions, civil society organizations, multilateral banks and specialist consultancies whereas IWGs are represented by industry experts including potential bond issuers and investors. A period of public consultation offers the opportunity to any member of the public to comment on the Criteria. This document aims to capture these various dialogues and inputs and substantiate the reasoning behind the Forestry Criteria.

This Background Document begins with an introduction to the challenges in financing a low carbon and climate resilient world and the role that bonds can play in meeting this challenge, particularly through the standardization of green definitions. This is followed by Section 2, which introduces the forestry sector and the implications of climate change on the sector in terms of both emissions and climate risks. Section 3 explains the principles and boundaries of Forestry Criteria development. Section 4 synthesizes the discussions arising from the TWGs, IWGs, and public consultation and presents the resulting Criteria.

Supplementary information available in addition to this document include:

1. Forestry Criteria Brochure: a 2-page summary of the Forestry Criteria.
2. Forestry Criteria Document: the complete Criteria requirements.
3. Climate Bonds Standard V2.1: the umbrella document laying out the common requirements that all Certified Climate Bonds need to meet, in addition to the sector-specific Criteria (V2.1 is the most recent update version).
4. Climate Bonds Standard & Certification Scheme Brochure: an overview of the purpose, context and requirements of the Climate Bonds Standard & Certification Scheme.

For more information on the Climate Bonds Initiative and the Climate Bonds Standard & Certification Scheme, see <https://www.climatebonds.net/standard>. For the documents listed above, see <https://www.climatebonds.net/standard/forestry>

## 1.2 Funding needs of a low-carbon and climate resilient economy

The current trajectory of climate change, expected to lead to global warming of 3.1-3.7°C by 2100<sup>1</sup> poses an enormous threat to the future of the world's nations and economies. The effects of climate change and the risks associated with a greater than 2°C rise in global temperatures by the end of the century are significant: rising sea levels, increased frequency and severity of hurricanes, droughts,

<sup>1</sup> According to Climate Tracker, under current policies we could expect 3.1-3.7°C: <http://climateactiontracker.org/global.html>

wildfires and typhoons, and changes in agricultural patterns and yields. Avoiding such catastrophic climate change requires a dramatic reduction in global greenhouse gas emissions.

To ensure sustainable development and halt climate change, all future infrastructure, both built and nature-based, needs to be low-carbon and resilient to climate change, without compromising the kind of economic growth needed to improve the livelihoods and wellbeing of the world's most vulnerable citizens. Global infrastructure investment is expected to amount to USD 90 trillion over the next 15 years, which is more than the entire current infrastructure stock.<sup>2</sup>

Ensuring that the infrastructure built is low-carbon raises the annual investment needs by 3–4%.<sup>3</sup> Climate adaptation needs add another significant amount of investment, which is estimated at USD 280–500 billion per annum by 2050 for a 2°C scenario.<sup>4</sup>

According to the Task Force on Climate-related Financial Disclosures (TCFD), there are two broad channels through which climate change can present risks to business activities and assets<sup>5</sup>:

1. Physical risk: the risk of impacts from climate- and weather-related events, such as floods and storms that damage property or disrupt supply chains and trade;
2. Transition risk: the financial risks that could result from the process of adjustment towards a lower-carbon economy. These include sudden shifts in demand; legal risk due to parties who have suffered loss or damage seeking compensation; and changes in policy favouring lower carbon technologies.

These could prompt a reassessment of the value of a large range of assets as costs and opportunities become apparent, and widespread inadequate information on these risks could even threaten the stability of the financial system. Risks to financial stability will be minimised if the transition to a low carbon and climate resilient economy begins early and follows a predictable path, thereby helping the market anticipate a smooth transition to a 2°C warming world.

### 1.3 Green bonds are critical to mobilising the capital required

Traditional sources of capital for infrastructure investment, such as governments and commercial banks lending, are insufficient to meet capital requirement needs to 2030. Institutional investors, particularly pension and sovereign wealth funds, are increasingly looked to as viable actors to fill these financing gaps.

Capital markets enable issuers to tap into large pools of private capital from institutional investors. Bonds are appropriate investment vehicles for these investors as they are low-risk investments with long-term maturities, making them a good fit with institutional investors' liabilities (e.g. pensions to be paid out in several decades).

<sup>2</sup> New Climate Economy (2016). Better Growth, Better Climate.

<sup>3</sup> New Climate Economy (2016). The Sustainable Infrastructure Imperative: Financing for Better Growth and Development.

<sup>4</sup> UNEP (2016). The Adaptation Finance Gap Report.

<sup>5</sup> TCFD's 'Recommendations of the Task Force on Climate-related Financial Disclosures': <https://www.fsb-tcf.org/publications/final-recommendations-report/>

Bond financing works well for low-carbon and climate-resilient infrastructure, particularly for refinancing projects and assets post-implementation, as capital markets also facilitate risk management. Across investors and financial markets, different entities face different types and severities of risks related to climate change, depending on many factors including degree of long-term exposure, likelihood of negative climate impacts, and ability to mitigate impacts or shift positions.

Bonds offer relatively stable and predictable returns, and long-term maturities. This makes them a good fit with institutional investors' investment needs. Labelled green bonds are bonds with proceeds used for green projects, mostly climate change mitigation or adaptation projects, and labelled accordingly. The rapid growth of the labelled green bond market has shown in practice that the bond markets provide a promising channel to finance climate investments.<sup>6</sup>

The green bond market can reward bond issuers and investors for sustainable investments that accelerate progress toward a low carbon and climate resilient economy. Commonly used as long-term debt instruments, green bonds are issued by governments, companies, municipalities, commercial and development banks to finance or re-finance assets or activities with environmental benefits. Green bonds are in high demand and can help issuers attract new types of investors.

Green bonds are regular bonds with one distinguishing feature: proceeds are earmarked for projects with environmental benefits, primarily climate change mitigation and adaptation. A green label is a discovery mechanism for investors. It enables the identification of climate-aligned investments with limited resources for due diligence. By doing so, a green bond label reduces friction in the markets and facilitates growth in climate aligned-investments.

However, currently green bonds account for less than 0.2% of the global bond market, with approx. USD 380 billion<sup>7</sup> of green bonds outstanding, compared to the global bond market of USD 100 trillion. The potential for scaling up is tremendous. The market now needs to grow much bigger, and quickly.

## 1.4 Introduction to Climate Bonds Initiative and the Climate Bonds Standard

The Climate Bonds Initiative is an investor-focused not-for-profit organisation whose goal is to promote large-scale investments through green bonds and other debt instruments to accelerate a global transition to a low-carbon and climate-resilient economy.

Activating the mainstream debt capital markets to finance and refinance climate-aligned projects and assets is critical to achieving international climate goals, and robust labelling of green bonds is a key requirement for that mainstream participation. Confidence in the climate objectives and the use of funds intended to address climate change is fundamental to the credibility of the role that green bonds play in a low carbon and climate resilient economy. Trust in the green label and transparency to the underlying assets are essential for this market to reach scale but investor capacity to assess green credentials is limited, especially in the fast-paced bond market. Therefore, the Climate Bonds Initiative created Climate Bonds Standard & Certification Scheme, which aims to provide the green bond market with the trust and assurance that it needs to achieve scale.

The Climate Bonds Standard & Certification Scheme is an easy-to-use tool for investors and issuers to assist them in prioritising investments that truly contribute to addressing climate change, both from

<sup>6</sup> See Climate Bonds Initiative's 'State of the Market' Report for more information: <https://www.climatebonds.net/resources/reports/bonds-and-climate-change-state-market-2017>

<sup>7</sup> Source: Climate Bonds Initiative (June 2018)



a resilience and a mitigation point of view. It is made up of the overarching Climate Bonds Standard detailing management and reporting processes, and a set of Sector Criteria detailing the requirements assets must meet to be eligible for certification. The Sector Criteria covers a range of sectors including solar energy, wind energy, marine renewable energy, geothermal power, low carbon buildings, low carbon transport, and water. The Certification Scheme requires issuers to obtain independent verification, pre- and post-issuance, to ensure the bond meets the requirements of the Climate Bonds Standard.

## 1.5 Process for Sector Criteria Development

The Climate Bonds Standard has been developed based on public consultation, road testing, review by the assurance roundtable and expert support from experienced green bond market actors. The Standard is revisited and amended on an annual basis in response to the growing green bond market. Sector specific Criteria, or definitions of green, are developed by TWGs, made up of scientists, engineers and technical specialists. Draft Criteria are presented to IWGs before being released for public comment. Finally, Criteria are presented to the Climate Bonds Standard Board for approval (see diagram below).

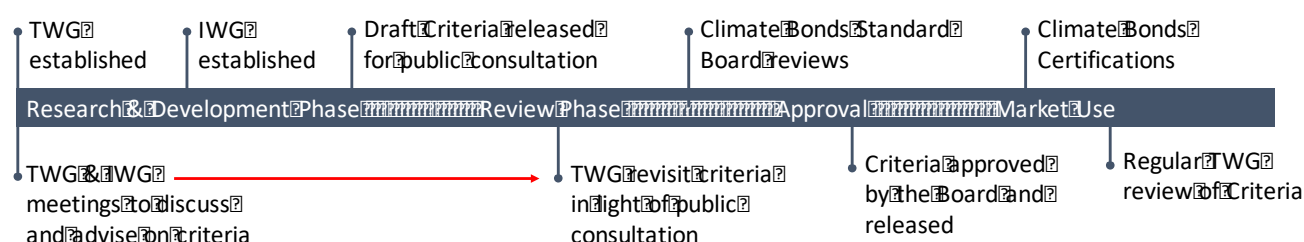


Figure 1: process for developing Climate Bonds Standard Sector Criteria

To date, Sector Criteria for wind, solar, geothermal, marine renewables, road transport, water and buildings are available for certification. Sector Criteria for hydropower, bioenergy, fisheries, coastal infrastructure, waste management, agriculture, protected agriculture and shipping are under development. Working groups for energy distribution & management, ICT and industrial energy efficiency will be launched soon.

## 1.6 Revisions to these Criteria

As part of the Climate Bonds Initiative's goal to accelerate a global transition to a low-carbon, resilient economy, the Forestry Criteria seek to maximize viable bond issuances with verifiable environmental outcomes. This guidance should be recognised as the first set of sector-specific guidance for land use. All groups and individuals involved recognise the breadth and complexity of this sector and emphasise that this guidance should be a foundation on which to encourage increased transparency and consistency in application of scientific best practices and data in the context of bond issuances. Note that Climate Bonds Initiative expects that the Forestry Criteria may be refined over time, however any approvals given will not be removed or changed retroactively. These eligibility criteria should be recognized as a starting point.

These Criteria will be reviewed two years after launch, or potentially earlier if the need arises, at

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which point the TWG will take stock of issuances that arise in the early stages and any developments in improved methodologies and data that can increase the climate integrity of future bond issuances. After the first review, the Criteria will be reviewed again periodically on a needs basis as technology and the market evolves. As a result, the Criteria are likely to be refined over time, as more information becomes available.

## 2 Sector Overview

### 2.1 What are Forestry assets?

Investments in the forestry sector are 'real asset' investments (i.e. they are physical assets that have a value due to their substance and properties). Forestry related assets are featured in institutional investor allocations. These types of investments occur globally but are particularly essential components of most emerging economies where land use related sectors are key contributors to national economies, state budgets, employment, and resource security. Appropriate and responsible investments in the forestry sector can help developed and emerging economies transition to more sustainable growth pathways, especially where these investments help to increase adaptive capacity and resilience to climate change. Generally, investor interest in these sectors is likely to increase due to fundamental drivers such as the need to meet demands for forest products from a growing global population with a fixed land base.<sup>8</sup>

The three broad categories that the Forestry Criteria includes in its scope are; (i) assets and projects related to commercial forestry, (ii) conservation and restoration forestry and (iii) the necessary supporting infrastructure to both. Within each of these categories, the actual assets and projects that we expect to see as use of proceeds in green bonds seeking Certification are:

- Plantation forests
- Sustainably managed natural forests
- Conservation forests
- Land under reforestation or restoration
- Protected lands
- Equipment for the management and maintenance of all forests
- Equipment for harvesting timber
- Timber storage facilities
- Supply chain facilities, such as nurseries, panel production and pulp and paper production
- Monitoring facilities, such as weather stations and warning systems for fire, illegal incursion, epidemics, floods or droughts

The scope of the assets covered by the Forestry Criteria is fully discussed in section 3.2.

<sup>8</sup> According to the Global Impact Investing Network, "impact investments are investments made into companies, organizations, and funds with the intention to generate a measurable beneficial social or environmental impact alongside a financial return."

## 2.2 Forestry and climate change

The forestry sector plays a critical role in the global carbon cycle. Forests have the potential to be large carbon sinks but deforestation and forest degradation cause significant global GHG emissions. This sector offers opportunities for both GHG emission reductions and carbon sequestration. If the world is to limit global warming to 2°C or 1.5°C, large-scale capture and storage of carbon in vegetation and soil is essential and forestry is one tangible way to achieve this.

Research by the United Nations Food and Agriculture Organization (FAO), published in April 2014, indicates that GHG emissions from agriculture, forestry, and fisheries have nearly doubled over the past 50 years and could increase a further 30% by 2050 in the absence of greater reduction efforts.<sup>9</sup> However, the IPCC indicates that the economically feasible mitigation potential for the land use sectors in the year 2030 is expected to be 7.2 to 11 GtCO<sub>2</sub>eq/year.<sup>10</sup> Mitigation measures in the land use sectors can take the following major forms:

- Carbon sequestration (e.g., carbon uptake in plants and soils);
- Reduced GHG emissions, and;
- Increased GHG emission efficiency (i.e., fewer GHGs emitted per unit of production).<sup>11</sup>

Substantial effort and investment must go into ensuring the forestry sector is a net carbon sink rather than a GHG emitter. Net reduction of GHG emissions in the forestry sector is an essential part of the global response to climate change. There are several features that differentiate the forestry sector from other arenas for climate bond issuance, specifically:<sup>12</sup>

- Forest systems can act as both sources of or as sinks for GHGs
- Stocks vs. flows: some approaches measure GHGs from forests by estimating the difference in carbon stocks ('stock-difference method'), instead of looking directly at fluxes (measurement of emissions over intervals of time, which is common in other sectors).
- Impacts of natural events on rates of GHG emissions can be large (e.g., fires) and it may be difficult to separate 'natural' and anthropogenic impacts.
- Temporal cycles in GHG emissions, linked to management (e.g., harvesting) and other factors (e.g., drought), occur at multiple scales (e.g., annual, inter-annual).
- Issues of permanence and legacy of activities are complex: different carbon pools may be vulnerable to future release to the atmosphere. Land management activities may have long-term impacts on emissions (e.g., deforestation in peatlands may influence GHGs for many decades). Saturation of GHG uptake will also vary due to management practices, and over time.
- Spatial variation in GHG emissions is very high, influenced by inherent landscape characteristics (e.g., different types of above- and below-ground carbon pools) and management decisions (e.g., tree composition; harvest frequency).<sup>13</sup>
- Emissions and sequestration potential is highly heterogeneous in nature. This means that uncertainty around net emissions from this sector is high.<sup>14</sup> The UNFCCC (and associated IPCC guidance) therefore encourages improving methodologies over time, while also stressing that time-series information must be comparable

<sup>9</sup> Tubiello et al., 2014.

<sup>10</sup> IPCC, 2014b.

<sup>11</sup> See <http://www.fao.org/docrep/015/an112e/an112e00.pdf> and examples of Walmart's efforts to reduce supply chain GHGs can be found in Plambeck, 2012.

<sup>12</sup> Many of these are modified from Iversen et al., 2014.

<sup>13</sup> Another spatial issue for land use sectors is leakage, however this affects all sectors.

<sup>14</sup> Met Office Hadley Centre. 2012.

- Forestry activities, projects and assets have high relevance for adaptation and resilience efforts and importance for rural livelihoods and environmental integrity (e.g., biodiversity, watershed functioning, energy security)

Afforestation, reforestation, and forest management to maximize carbon sequestration are recognized as key strategies for climate mitigation by the Paris agreement because they are expected to slow global warming by removing CO<sub>2</sub> from the atmosphere. However, the actual mitigation effect of forestry activities will be influenced by many factors such as location, scale, and management effectiveness. In Europe for example, 250 years of land use change has increased forested areas by 10% and put over 85% of forests under management, yet this has not resulted in net CO<sub>2</sub> removal from the atmosphere because wood extraction released carbon stored in biomass, litter, dead wood, and soil carbon pools.<sup>15</sup> In addition, converting deciduous forests into coniferous forests has resulted in changes in albedo, canopy roughness, and evapotranspiration from the land surface, which contributed to warming rather than climate change mitigation. Peat fires are a major contributor to GHG emissions in Indonesia (40% of the total in 2005 and, in 2015, rivalling daily emissions in the U.S.) and could add an estimated 1 billion tons to the country's carbon footprint.<sup>16</sup>

Table 1. Sources of variation among forestry interventions.

Sources of variation	
Complexity	<ul style="list-style-type: none"> <li>• Essential components such as management practices, training, infrastructure (e.g., storage, processing), information systems (e.g., weather), inputs (e.g., fertilizers, irrigation), and technologies (e.g., equipment, improved genetics)</li> <li>• Experience, capability, and suitability in different regions</li> <li>• Heterogeneity of stakeholders</li> <li>• Potential impacts on social issues (in particular land tenure) and biodiversity</li> <li>• Reliance on public support or policy changes</li> </ul>
Financial viability and cost-effectiveness	<ul style="list-style-type: none"> <li>• Execution costs, including design and impact monitoring</li> <li>• Ease and costs of monitoring activities, outcomes, and revenue and benefit flows</li> <li>• Reliance on carbon offsets or Payments for Ecosystem Services (PES) schemes for revenue generation (as opposed to initiatives that can marshal multiple potential revenue streams)</li> <li>• Financial viability under different commodity market conditions and payback periods</li> </ul>
Evidence base	<ul style="list-style-type: none"> <li>• Available scientific information about the anticipated GHG reduction and co-benefits for different land use interventions</li> <li>• Varies widely among Non-Annex I countries, and even within Annex I countries</li> </ul>

While global and regional projections of forest-based mitigation opportunities are available, these opportunities need to be calibrated to specific geographic as well as sector-wide contexts with consideration for intervention success factors such as socio-economic conditions, tenure arrangements,<sup>17</sup> and commodity market access.<sup>18</sup> Companies and other entities that seek to achieve

<sup>15</sup> Naudts K et al. 2016. Europe's forest management did not mitigate climate warming. *Science*, 351(6273): 597-600.

<sup>16</sup> [https://forestsnews.cifor.org/37016/clearing-the-smoke-the-causes-and-consequences-of-indonesias-fires?fnl=en&utm\\_source=early+May+2017&utm\\_campaign=NEWS+UPDATE+English+v2&utm\\_medium=email](https://forestsnews.cifor.org/37016/clearing-the-smoke-the-causes-and-consequences-of-indonesias-fires?fnl=en&utm_source=early+May+2017&utm_campaign=NEWS+UPDATE+English+v2&utm_medium=email)

<sup>17</sup> For example, social forestry has been tested in Indonesia and elsewhere. [https://forestsnews.cifor.org/52241/lampung-indonesias-model-province-for-social-forestry?fnl=en&utm\\_source=General+contacts&utm\\_campaign=afc14dd7ca-CIFOR\\_News\\_Update\\_November\\_early\\_2017&utm\\_medium=email&utm\\_term=0\\_282b77c295-afc14dd7ca-117330269](https://forestsnews.cifor.org/52241/lampung-indonesias-model-province-for-social-forestry?fnl=en&utm_source=General+contacts&utm_campaign=afc14dd7ca-CIFOR_News_Update_November_early_2017&utm_medium=email&utm_term=0_282b77c295-afc14dd7ca-117330269)

<sup>18</sup> Examples of useful guides include Upreti et al. 2012. and Dickie A. 2014.

net reduction in forest-related emissions will be interested to generate reasonably accurate estimates of GHG emissions reductions that are likely to result from changes in land and water management and supply chain processes. Various tools have been developed for estimating mitigation impact in the land use sectors to support regulated and voluntary GHG offset programs and supply chain approaches.<sup>19</sup>

## 2.3 Climate targets and transition trajectory

Climate mitigation in the forestry sector is strongly linked to avoiding deforestation and land use change. The total carbon content of forests has been estimated at 638 Gt for 2005, which is more than the amount of carbon in the entire atmosphere.<sup>20</sup> According to the IPCC in its Fourth Assessment Report, reducing and/or preventing deforestation is the mitigation option with the largest and most immediate carbon stock impact in the short term.<sup>21</sup>

Frontrunner companies have committed to zero deforestation supply chains. Studies suggest that significant, relatively low-cost mitigation potential exists in the forestry sector, and that some of these opportunities may have significant economic and financial benefits for producers and nations.

Many companies have begun to invest in adapting their businesses to make them more resilient to climate change.<sup>22</sup> For example, forest products company, Sveaskog AB, is establishing a Green Bond Framework focused on investments in sustainable forestry projects and assets that promote low-carbon and climate resilient growth.<sup>23</sup> However, it is generally recognised that investment mechanisms for climate change adaptation and resilience are at an earlier stage of development than mitigation mechanisms, which have been tested in a broader range of sectors and geographies.

## 2.4 Investment need

The UNFCCC has estimated that, globally, an additional USD 14 billion in financial flows will be required to address climate impacts in agriculture, forestry, and fisheries by 2030.<sup>24</sup> In the context of the forestry sector, estimates vary:<sup>25</sup>

- The International Institute for Applied Systems Analysis (IIASA) suggests USD 30–53 billion are required per year to achieve zero net deforestation and degradation by 2020;
- UNEP estimates that USD 17-33 billion per year is required to achieve a 50% reduction in deforestation by 2030, and;
- WWF estimates that a minimum of USD 42 billion per year is needed by 2020.
- Restoration of peat forests and other burned areas in Indonesia is projected to costs USD 5.5 billion over five years<sup>26</sup>

Several UNFCCC mechanisms have stimulated limited funding for mitigation and adaptation in the land use sectors including through the UNFCCC Clean Development Mechanism (CDM) and Joint

<sup>19</sup> There include; The Cool Farm Tool, CALM Calculator, COMET-Farm, EX-ACT Carbon Balance Tool, Carbon Benefits Project toolbox, FullCam, CAR livestock tool, LCA tools

<sup>20</sup> [https://unfccc.int/files/press/backgrounders/application/pdf/fact\\_sheet\\_reducing\\_emissions\\_from\\_deforestation.pdf](https://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_reducing_emissions_from_deforestation.pdf)

<sup>21</sup> [https://unfccc.int/files/press/backgrounders/application/pdf/fact\\_sheet\\_reducing\\_emissions\\_from\\_deforestation.pdf](https://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_reducing_emissions_from_deforestation.pdf)

<sup>22</sup> Several examples are presented in the UNFCCC Private Sector Initiative database on actions on adaptation:

[http://unfccc.int/adaptation/workstreams/nairobi\\_work\\_programme/items/6547.php](http://unfccc.int/adaptation/workstreams/nairobi_work_programme/items/6547.php)

<sup>23</sup> [https://www.sveaskog.se/Documents/Om%20Sveaskog/Finansiering/Sveaskog\\_Opinion%20final.pdf](https://www.sveaskog.se/Documents/Om%20Sveaskog/Finansiering/Sveaskog_Opinion%20final.pdf)

<sup>24</sup> [https://unfccc.int/files/cooperation\\_and\\_support/financial\\_mechanism/application/pdf/adaptation.pdf](https://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/adaptation.pdf)

<sup>25</sup> WWF. March 2012. WWF submission on finance to AWG LCA. <http://unfccc.int/resource/docs/2012/smsn/ngo/201.pdf>

<sup>26</sup> [https://forestsnews.cifor.org/44299/tax-amnesty-the-green-economy-and-peat-restoration?fnl=en&utm\\_source=early+May+2017&utm\\_campaign=NEWS+UPDATE+English+v2&utm\\_medium=email](https://forestsnews.cifor.org/44299/tax-amnesty-the-green-economy-and-peat-restoration?fnl=en&utm_source=early+May+2017&utm_campaign=NEWS+UPDATE+English+v2&utm_medium=email)

Implementation (JI) mechanism, which sought to support the creation of a global voluntary carbon market, and the Adaptation Fund. More than USD 6 billion – primarily from donor governments including Norway, Germany, the UK and the US – has been provided for REDD+<sup>27</sup> activities in developing countries and additional funding is anticipated through the Green Climate Fund, which will support REDD+ readiness and diverse activities on previously forested lands, managed forests, and primary forests.<sup>28</sup> The World Bank's Forest Carbon Partnership Facility (FCPF) focussing on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests and the enhancement of forest carbon stocks in developing countries (REDD+). It has two separate funding mechanisms, the Readiness Fund and the Carbon Fund.<sup>29</sup>

While REDD+ has received significant attention in policy dialogues such as the UNFCCC, the UN Convention on Biological Diversity (CBD), the Convention to Combat Desertification (UNCCD), and the post-2015 Sustainable Development Goals (SDGs), private finance has been modest and demonstration of emission reduction at scale is pending.<sup>30</sup> At a global level, sales of voluntary or government-sanctioned carbon offset credits are unlikely to generate sufficient funding to meet forestry sector mitigation and adaptation needs.<sup>31</sup>

Efforts to avoid deforestation through investments in sustainable intensification of agriculture include the recent international commitment, anchored by a USD 100 million contribution from Norway, for a USD 400 million fund intended to catalyse protection of 5 million hectares of forests and peatlands through increased productivity of smallholder farmers.<sup>32</sup>

The objective of the Forestry Criteria is not to specify eligibility criteria for receiving offset credits that can generate revenue through sale of credits in carbon markets. Offset (carbon credit) based revenue streams are only likely to be considered relevant by investors where there is robust market demand for purchase of offset credits (e.g., geographies where there is a clear policy framework such as in the US State of California). To mobilize investment in sustainable forestry from large pools of global capital, bond issuers will need to repay bond debt by generating revenues in more traditional ways such as through sale of forest products or revenue streams related to production (e.g., inputs, trade finance).

## 2.5 Bonds in the sector

Research conducted by Climate Bonds Initiative has identified up to USD 8.5 billion<sup>33</sup> in outstanding bonds clearly aligned with the land use sector, representing 1% of the total universe of climate-themed bonds.<sup>34</sup> Paper and pulp manufacturers were responsible for the majority of the 63 land use related bonds identified. For example, Swedish forest products company SCA issued a green bond in 2014, which included a commitment to increase forest cover by 1% each year. Table 2 provides recent examples of bonds in the forestry sector.

<sup>27</sup> REDD+ refers to reducing emissions from deforestation and forest degradation and conserving, sustainably managing and enhancing forest carbon stocks.

<sup>28</sup> [https://forestsnews.cifor.org/50548/green-climate-fund-steps-up-to-reduce-deforestation-and-forest-degradation?fnl=en&utm\\_source=General+contacts&utm\\_campaign=d4fff2fd6d-CIFOR\\_News\\_Update\\_31\\_July\\_20176\\_7\\_2017&utm\\_medium=email&utm\\_term=0\\_282b77c295-d4fff2fd6d-117330269](https://forestsnews.cifor.org/50548/green-climate-fund-steps-up-to-reduce-deforestation-and-forest-degradation?fnl=en&utm_source=General+contacts&utm_campaign=d4fff2fd6d-CIFOR_News_Update_31_July_20176_7_2017&utm_medium=email&utm_term=0_282b77c295-d4fff2fd6d-117330269)

<sup>29</sup> <https://www.forestcarbonpartnership.org/about-fcpf-0>

<sup>30</sup> [https://forestsnews.cifor.org/50326/redd-results-based-finance?fnl=en&utm\\_source=General+contacts&utm\\_campaign=b3b797da64-CIFOR\\_News\\_Update\\_July\\_20176\\_7\\_2017&utm\\_medium=email&utm\\_term=0\\_282b77c295-b3b797da64-117330269](https://forestsnews.cifor.org/50326/redd-results-based-finance?fnl=en&utm_source=General+contacts&utm_campaign=b3b797da64-CIFOR_News_Update_July_20176_7_2017&utm_medium=email&utm_term=0_282b77c295-b3b797da64-117330269)

<sup>31</sup> See [http://www.forest-trends.org/documents/files/doc\\_4841.pdf](http://www.forest-trends.org/documents/files/doc_4841.pdf)

<sup>32</sup> <https://innovation-forum.co.uk/analysis.php?s=drive-for-deforestation-jurisdictional-approach-continues>

<sup>33</sup> State of the Market in 2017, Climate Bonds Initiative

<sup>34</sup> See <http://www.climatebonds.net/files/post/files/cb-hsbc-15july2014-a3-final.pdf>



Table 2. Examples of recent bonds in the forestry sector.

Issuer	Year	Description	Credentials
Skandinaviska Enskilda Banken AB (SEB)	2017	USD 531mn bond, eligible projects for funding: renewable energy, energy efficiency, clean transport, pollution prevention / control, and sustainable forestry (FSC or equivalent required) <sup>35</sup>	Cicero second opinion
Klabin	2017	USD 500mn bond, eligible projects for funding: Sustainable Forest Management (FSC-certified new planting and replanting activities; native forest restoration), renewable energy, energy efficiency, clean transport, waste management, water management, circular economy, adaptation (biological pest control, fire risk prevention) <sup>36</sup>	Sustainalytics second opinion
International Finance Corporation	2016	USD 152mn bond to support management of 500,000 acres of dryland forest. Investors choose repayment in either cash payments or carbon credits <sup>37</sup>	Sold to major global institutional investors
Poland	2016	€750mn bond, linked to national climate mitigation commitments, eligible projects for funding: renewable energy, clean transport, sustainable agriculture, afforestation, parks conservation, land remediation <sup>38</sup>	Sustainalytics second opinion
Eco Securitizadora	2016	BRL 1bn (USD 294mn) 8-year green securitization (CRA, Agribusiness Receivables Certificates) issued with backing of 100% export credit receivables from Suzano Pulp & Paper. Use of proceeds presumed to be aligned with Suzano's sustainable forestry strategies <sup>39</sup>	
Svenska Cellulosa Aktiebolaget (SCA)	2014	SEK 1.5bn (USD 232mn) bond, eligible projects for funding: renewable energy, fuel-switching to bio-fuels, biofuels from forest waste, energy efficiency, water and waste management, sustainable forestry <sup>40</sup>	Cicero second opinion
Ontario, Canada	2014	CAD 500mn 4-year bond, eligible projects for funding: clean transport, green buildings, clean energy, forestry, agriculture, land management, adaptation <sup>41</sup>	Cicero second opinion; 83% purchased by Canadian investors
Sumitomo Forestry	2013	JPY 20bn to pay back first series of unsecured corporate bonds, invest in wood construction material businesses and other businesses	N/A

<sup>35</sup> <https://www.climatebonds.net/2017/03/first-gbs-slovenia-and-argentina-new-securitisations-mta-gb-going-retail-quebec-nab>

<sup>36</sup> <https://www.climatebonds.net/2017/10/icbc-biggest-bank-world-issues-certified-green-ireda-issues-certified-green-india-austrian>

<sup>37</sup> <https://www.climatebonds.net/2016/11/morocco-gbs-india-sweden-and-spain-china-france-work-gbs-boc-nrwbank-and-lots-interesting>;

[http://www.ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/first-forests-bond-on-the-lse](http://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/first-forests-bond-on-the-lse)

<sup>38</sup> <https://www.climatebonds.net/2016/12/poland-wins-race-issue-first-green-sovereign-bond-new-era-polish-climate-policy>

<sup>39</sup> <https://www.climatebonds.net/2016/11/1st-green-bond-brazilian-currency-suzano-papel-celulose-brl1-bn-usd-294m-no2-suzano>

<sup>40</sup> <https://www.climatebonds.net/2014/05/swedens-sca-issues-sek15bn-232m-5yr-green-bond-2nd-viking-corporate-green-bond-issuer>

<sup>41</sup> <https://www.climatebonds.net/2014/10/ontario-issues-long-awaited-inaugural-green-bond-cad-500m-4481m-175-4yrs-aa2e-mixed>



Issuer	Year	Description	Credentials
Nord-Pas de Calais, France	2012	€80mn, 12-year bond, eligible projects for funding: transport / infrastructure (70%), energy (20%), biodiversity (10%: regional forest development etc.) <sup>42</sup>	facilitated by Credit Agricole
Inversiones (Empresas CMPC subsidiary)		USD 500mn, 10-year bond, eligible projects for funding: sustainable forest management for plantations (certified by FSC, CERTFOR (PEFC) or equivalent), biodiversity preservation restoration of HC VF, sustainable water management, pollution prevention and control, energy efficiency <sup>43</sup>	Sustainalytics second opinion

### 3 Principles and Boundaries of the Sector Criteria

#### 3.1 Guiding principles

The Climate Bond Standard needs to ensure that the forestry assets and projects included in Certified Climate Bonds are low carbon and climate resilient, in line with best available scientific knowledge and compatible with the goals of the Paris Agreement. At the same time, the Forestry Criteria need to be pragmatic and readily usable by stakeholders in the market, to maximise engagement and use. High transaction costs run the risk of reducing uptake of the Standard. Keeping the costs of assessment down while maintaining robust implementation of the criteria is important. Table 3 sets out the principles guiding the development of the Forestry Criteria to meet and balance these two goals.

<sup>42</sup> <https://www.climatebonds.net/2014/05/new-%E2%82%AC80m-12yr-french-enviro-bond-90-over-subscribed-calais-shows-way>

<sup>43</sup> <https://www.climatebonds.net/2017/08/april-market-blog-inaugural-gbs-chile-uae-more-french-and-aussie-certified-bonds-us-munis>

Table 3: Key principles for the design of the Forestry Criteria

Principle	Requirement for the Criteria
Level of ambition	Compatible with meeting the objective of keeping global temperature rise well below 2°C above pre-industrial levels set by the Paris Agreement, and with a rapid transition to a low carbon and climate resilient economy.
Robust system	Scientifically robust to maintain the credibility of the Climate Bond Standard.
“Do not reinvent the wheel”	Harness existing robust, credible tools, methodologies, standards and data to assess the low carbon and climate resilient credentials of any technology, endorsed by multiple stakeholders where possible.
Level playing field	No discrimination against certain groups of producers (such as smallholders) or geographies.
Multi-stakeholder support	Supported and developed by key stakeholders; those within the relevant industry, the financial community and broader civil society.
Continuous improvement	Subject to an evolving development process with the aim of driving continuous improvement and credibility in the green bond market.

Development of the Forestry Criteria is intended to broaden knowledge and capacity among potential bond issuers about the credentials forestry projects and assets must have if they are to be considered low carbon and climate resilient.

In addition to the overarching principles discussed in the table above, the following additional considerations were central to developing the Criteria and facilitating the scoping process.

### 3.1.1 Eligibility based on interventions

Defining bond eligibility under the Forestry Criteria based on interventions means deciding eligibility and compliance based on plans and processes as a proxy for expected climate impact. This approach is necessary to:

- Be flexible for bond issuers regardless of whether they are financing new or refinancing existing projects and assets
- Be measurable during implementation phases
- Keep transaction costs of proving compliance low

Development of metrics and benchmarks, suitable for outcome based eligibility, was not possible for the Forestry Criteria. For other Sector Criteria, such as the Geothermal Criteria and the Transport Criteria, standardized metrics have made use of technology-based emissions profiles and decarbonisation scenarios from the IEA. This is not possible for forestry, as it has not been incorporated into these models and few organisations in the forestry sector are measuring their total GHG emissions.

### 3.1.2 Technology agnostic

In general, the Climate Bonds Standard avoids picking 'winners and losers' in terms of technologies – a task beyond its mandate and capacity. Environmental impacts of some forest commodities have generated significant alarm as have some technologies, such as genetically modified seeds.<sup>44</sup> For these examples and others, controversy continues in part because the scientific, commercial, economic, and policy dimensions remain unsettled and broad agreement has not emerged for how to resolve trade-offs.

Recognizing the highly variable and dynamic nature of commodity production and the complexity of related scientific underpinnings, the Forestry Criteria take a technology and commodity agnostic approach by stipulating processes that must be adhered with to achieve Climate Bonds Certification.

### 3.1.3 Prioritization

The Criteria determines the scope of eligible project based on two key considerations: mitigation potential and demand for bond issuance. Some forestry activities will coincide with both categories, while others may be linked to one or the other. The Forestry Criteria have been developed to encompass activities that fall under either category to promote inclusiveness and enable Climate Bonds Certification for a diverse range of activities. The scope may be expanded with revisions to include new mitigation technologies that emerge and reflect growing or changing demand from the bond market.

## 3.2 Assets in Scope

Eligible assets include land, machinery, equipment, inputs, information systems, risk monitoring and early warning systems, and other relevant technologies. Eligible activities include land and resource management (including remediation or rehabilitation), set-asides, training, research, and prevention of illegal land or resource use.

The scope of eligible assets and activities is presented in Table 4 and has been organized using a traffic light system for ease of use as follows:

- Green: almost certain to be compatible with a low carbon or climate-resilient economy in all circumstances and automatically assumed to be eligible for certification
- Red: almost certain to be incompatible with a low carbon or climate-resilient economy and automatically assumed to be ineligible
- Amber: ambiguous and needing further assessment to determine its eligibility

The first column in Table 4, 'Eligible activity types', gives an exhaustive list of all the activity types that are within scope of the Forestry Criteria. The second column, 'Example use of proceeds', is an illustrative list of the type of projects that may be included in a Certified Climate Bond. It is not possible to include an exhaustive list of all potential use of proceeds due to the breadth of possibilities, but all use of proceeds must fall within one of the specified eligible activity types.

<sup>44</sup> Over recent decades, scientific evaluations of the use of GMOs in agriculture have provided a mixed picture regarding environmental and health impacts, while a range of interest groups have taken strong advocacy positions.

Table 3: scope of eligible projects and assets for Climate Bonds Certification under the Forestry Criteria

Eligible activity types	Example use of proceeds	Mitigation	Adaptation & resilience
Plantation forestry – planted forest that is intensively managed and meet all the following criteria at planting and stand maturity: one or two species, even age class and regular spacing <sup>45</sup>	Land acquisition for purpose of establishing or expanding forest stands for timber production	●	●
	The purchase of equipment and cost of resources needed for planting and replanting activities (such as seedling production, soil preparation, and seedling planting, nursery maintenance, pest control), ongoing maintenance, clearing, thinning, fertilisation, management, harvesting and extracting.	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
Sustainable forest management – commercial management of natural forests in a sustainable manner for the production of timber. Natural forests are forest areas with many of the principal characteristics and key elements of a native ecosystem, such as complexity, structure and biological diversity, including soil characteristics, flora and fauna, in which all or almost all the trees are native species, not classified as plantations <sup>46</sup>	Land acquisition for purpose of establishing or expanding native forest stands for commercial sustainable forest management	●	●
	The purchase of equipment and cost of resources needed for activities (such as seedling production, soil preparation, and seedling planting, nursery maintenance, pest control), ongoing maintenance and management, clearing, thinning, fertilisation, harvesting and extracting	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
Production of non-timber forest products (NTFP) – the commercial cultivation and/ or extraction of goods derived from forests that are tangible and physical objects of biological origin other than wood. <sup>47</sup> Includes, amongst other things, the commercial cultivation and harvesting of amriso (broom grass), timur, bamboo stems, bamboo shoots, paper mulberry bark, rattan stems, gum, resin, nuts, mushrooms, fruits, herbs, spices, aromatic plants, game, fibres, medicinal, cosmetic or cultural produce. Can be practised in either plantations or sustainably managed forests.	Land acquisition for purpose of establishing or expanding either plantation or natural forest stands	●	●
	The purchase of equipment and cost of resources needed for all operational activities associated with maintaining forests for NTFP and for harvesting and extracting the NTFP	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
Forest conservation - non-commercial forestry activities designed to maintain the existing	Land acquisition for purpose of protecting and conserving, forested areas for a range of ecosystem services	●	●

<sup>45</sup> FAO, Global Forest Resource Assessment 2020: Terms and Definitions, FRA 2020

<sup>46</sup> 'Natural forest' includes the following categories: (i) Forest affected by harvesting or other disturbances, in which trees are being or have been regenerated by a combination of natural and artificial regeneration with species typical of natural forests in that site, and where many of the above-ground and below-ground characteristics of the natural forest are still present. In boreal and north temperate forests which are naturally composed of only one or few tree species, a combination of natural and artificial regeneration to regenerate forest of the same native species, with most of the principal characteristics and key elements of native ecosystems of that site, is not by itself considered as conversion to plantations. (ii) Natural forests which are maintained by traditional silvicultural practices including natural or assisted natural regeneration. (iii) Well-developed secondary or colonizing forest of native species which has regenerated in non-forest areas. (iv) The definition of 'natural forest' may include areas described as wooded ecosystems, woodland and savanna. Definition from FSC

<sup>47</sup> FAO, Global Forest Resource Assessment 2020: Terms and Definitions, FRA 2020

forest habitat in both area and quality. Activities will range from minimal interventions to active management and could include protection from deforestation risk, voluntary and mandatory set aside and active conservation efforts	The purchase of equipment and cost of resources needed for the on-going maintenance and management of conservation forestry project	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
Forest restoration and rehabilitation – non-commercial forestry activities designed to increase the area or improve the quality of existing forest habitat or to establish new forest stands. Activities will range from minimal interventions to active restoration including facilitating regeneration and restoration via natural or artificial means,	Land acquisition for purpose of expanding and restoring forested areas for a range of ecosystem services	●	●
	The purchase of equipment and cost of resources needed for the on-going maintenance and management of restoration and rehabilitation forestry projects	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
	Reforestation or afforestation of former mined land	●	●
Conservation of non-forested land –conservation of non-commercially productive land to maintain the existing habitat in both area and quality. Activities could include the establishment of protected land or national parks, voluntary or mandatory set aside	Land acquisition for purpose of conserving existing areas for a range of ecosystem services	●	●
	The purchase of equipment and cost of resources needed for the on-going maintenance and management of conservation projects	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
Restoration or rehabilitation of non-forested land – restoration or rehabilitation of non-commercially productive land to improve the quality or to increase the area of existing habitats or to establish new habitats	Land acquisition for purpose of expanding and restoring existing areas and for establishing new habitats for a range of ecosystem services	●	●
	The purchase of equipment and cost of resources needed for the on-going maintenance and management of restoration and rehabilitation projects	●	●
	The cost of setting-up and maintaining protection measures (e.g. rangers and monitoring equipment). GIS analysis, satellite data collection and data analysis.	●	●
	Restoration or rehabilitation of former mined land	●	●
Supporting and supply chain infrastructure – infrastructure that is associated with the forestry sector and initial processing of timber. It could be processing of timber products into wood products or paper and pulp, storage, manufacture of monitoring and assessing equipment and plant nurseries	Cost of installation, upgrade, maintenance or running costs of manufacturing and processing facilities and associated equipment for solid wood production, veneer and plywood production and reconstituted panels	●	●
	Cost of acquiring, upgrade, maintenance or running costs for vehicles used on the forestry concession	●	●
	Cost of establishing, upgrading or maintain forest roads on the forestry concession	●	●
	Installation, upgrade or maintenance of warehouses and storage infrastructure and associated equipment	●	●
	Installation, upgrade or maintenance of warning systems or satellite monitoring for fire, illegal incursion, epidemics, invasion of harmful invasive species, flood and drought conditions.	●	●
	Installation, upgrade or maintenance of information and information management systems such as installation of weather, soil and plant information capture and analysis systems (e.g. weather stations), and	●	●

	technologies to promote precision forestry harvesting		
	Installation, upgrade or maintenance of plant nurseries supplying the forestry sector	●	●
	Cost of acquiring, upgrade, maintenance or running costs for aircraft used on the forestry concession	●	●
	Installation, upgrade or maintenance of fertiliser production infrastructure	●	●

### 3.3 Assets out of Scope

The red items in Table 4 are excluded either because they are incompatible with a low carbon or climate-resilient economy or because determining their eligibility is outside the mandate of the Forestry Criteria. The justifications for exclusions are presented in the following sections.

#### 3.3.1 Reforestation or restoration of former mined land

Reforestation, restoration, remediation or rehabilitation of former mined land is also out of scope for the Forestry Criteria. These Criteria have not been developed to consider the clean-up necessary for potentially highly polluted landscapes, such as formerly mined land.

#### 3.3.2 Fertiliser production

Fertiliser production is not included in the scope for the Forestry Criteria. This can be a very energy and chemical intensive process and requires a different set of Criteria to ensure its compatibility with a low carbon and climate resilient future.

#### 3.3.3 Aircraft

In some cases monitoring and management of forests may be done with light aircraft or helicopters. Any aircraft is not eligible use of proceeds because of the high GHG emissions they have. It is worth nothing that in most cases aircraft would be provided to a forestry issuer by a contractor and so would be unlikely to be financed in a forestry bond anyway.

### 3.4 Alignment with other Sector Criteria

The interconnected nature of the economy, infrastructure and terrestrial and aquatic ecosystems creates challenges for developing clearly delineated Sector Criteria. For example, investments in freshwater resources can be implemented in many sectors including agriculture (e.g., irrigation), forestry (e.g. restoration of watershed habitat), aquaculture, supply and sanitation (e.g., water supply or wastewater treatment), storage and transfer (e.g., reservoirs, pumping stations, aquifers), flood and drought management (including storm water), and natural resource management.

It is essential that clear guidance on which Sector Criteria assets and projects are eligible for Climate Bonds Certification is given. This saves confusion and means that it is clear, both to the verifier, issuer and investor, which requirements a given asset or project is expected to meet. Table 5 identifies possible overlaps and explains which Sector Criteria should be referred to in which cases. The following sections give further explanation.

Table 5: clarification of which Sector Criteria assets or activities are eligible for Climate Bonds Certification under

Supported by:



Assets or Activity	Applicable Sector Criteria
Land transport	Vehicles used within the forest concession up to the forest gate are applicable for Certification with the Forestry Criteria. Vehicles used beyond the forest concessions and past the forest gate must comply with the Transport Criteria.
Water transport	Vessels used within the forest concession up to the forest gate are applicable for Certification with the Forestry Criteria. Vessels used beyond the forest concessions and past the forest gate will be covered by the Shipping Criteria that are currently in development.
Restoration of forest for the purposes of watershed management, flood and drought protection	Must comply with the Water Criteria
Agroforestry, palm oil and silvopastoralism	Will be covered by the Agriculture Criteria. Excluded from Climate Bonds Certification under the Forestry Criteria because of cross-over with agriculture
Bioenergy facilities or plants	Must comply with the Bioenergy Criteria. Growth of timber derived bioenergy feedstocks (e.g. forest stands destined for bioenergy) must comply with the Forestry Criteria

### 3.4.1 Bioenergy feedstock and facilities

Entities with primary responsibility for forestry activities seeking to increase the sustainability of productive and conservation activities in forest ecosystems (e.g., producing fibre and fuel and supporting ecosystem services such as soil fertility or biodiversity), should seek certification under the Forestry Criteria.

The Forestry Criteria are not designed for entities working predominantly in the bioenergy industry (producing biodiesel, trading pellets, sourcing for bioenergy production, etc.). Assets and use of proceeds related to the processing or conversion of feedstocks for bioenergy or biofuels are covered by the Bioenergy Criteria.<sup>48</sup> Assets and use of proceeds related to the production of timber feedstocks for bioenergy are covered by the Forestry Criteria.

### 3.4.2 Watershed management or improvement

Forest assets or forestry activities may be carried out with the intent of restoring, improving or managing watersheds and flood or drought protection. This presents a cross-over with the Water Criteria<sup>49</sup> as the Water Criteria covers nature based infrastructure that can benefit watersheds or provide flood or drought protection.

To address this potential intersection, activities will be eligible with the Sector Criteria that aligns with their purpose. For example, if a forest is established or managed with the purpose of restoring a watershed it should comply with the Water Criteria, whereas if it is established or managed for the commercial production of timber it should comply with the Forestry Criteria.

<sup>48</sup> Full details of the Bioenergy Criteria can be found here: <https://www.climatebonds.net/standard/bioenergy>

<sup>49</sup> Full details of the Water Criteria can be found here: <https://www.climatebonds.net/standard/water>

### 3.4.3 Agroforestry or silvopastoralism

Any forestry assets or activities that are combined with agriculture will have to comply with the Agriculture Criteria. The Forestry Criteria have not been set-up to ensure that agriculture activities are low carbon and climate resilient. This will be tackled by a separate TWG and Agriculture Criteria will be developed with their expertise. During the Agriculture Criteria development, the Forestry Criteria requirements will be considered given that agroforestry has large reforestation potential.

### 3.4.4 Water transport

Shipping assets or other water based transport will be eligible for Climate Bonds Certification under the Shipping Criteria. Development of Shipping Criteria is to begin shortly. The exception to this rule are vessels that are used predominantly in the forest concession, which can be included as eligible use of proceeds under the Forestry Criteria.

### 3.4.5 Land transport

Supporting vehicles working on the forestry concession are an essential part of the management of all forestry operations. In addition, the carbon sequestration benefits of the forests should outweigh the emissions from vehicles. Requiring that these supporting vehicles comply with the Transport Criteria, would likely cause an issuer to decide not to get Climate Bonds Certification rather than remove vehicles from their use of proceeds. Instead, as these vehicles are necessary supporting infrastructure, particularly to good management of forests, they are included as eligible supporting infrastructure if they are used predominantly within the forest concession. Vehicles, such as trucks, that are used predominantly beyond the forest gate would still have to meet the Transport Criteria.<sup>50</sup>

## 4 Discussion and Eligibility Criteria

### 4.1 Overarching considerations

The purpose of the Forestry Criteria, like all Sector Criteria developed for the Climate Bonds Standard & Certification Scheme, is to certify assets and projects that are aligned with a low carbon economy and are climate resilient. Requirements for demonstration of alignment with these objectives will vary depending on the type of forestry that is being practiced. However, there are also overarching principles and considerations that apply to all types of forestry within scope. These are discussed in detail in this section.

#### 4.1.1 The overarching principles of the Forestry Criteria

The Forestry Criteria require compliance with the following:

- The investment results in land and natural resource management that directly contribute to reducing atmospheric greenhouse gas concentrations (GHGs) and maintaining carbon stocks, consistent with avoiding dangerous climate change, and have a net positive impact on mitigation (i.e., net GHG reduction)

<sup>50</sup> Climate Bonds Standard Transport Criteria can be found here: <https://www.climatebonds.net/standard/transport>

- No natural landscape should be converted, particularly because of the large emissions resulting from such land use change
- The issuance should demonstrate significant attention to climate risks and a clear plan for achieving a positive effect on operational resilience
- There is a neutral (at minimum) or positive net effect on the resilience of biodiversity and regulating ecosystem services (e.g., water supply, air quality) and habitats should be well managed

The requirements for each type of forestry assets (e.g. plantation forestry or sustainable forest management) are designed to reflect these overarching principles.

#### 4.1.2 Assets that mitigate GHG emissions

Bond issuances could, in theory, support assets or activities that have:

- Quantifiable on-site mitigation: for example, tree planting resulting in carbon sequestration.
- Positive transformational effects on a supply chain: for example, other companies adopt the practices of companies financed by certified bonds and thereby gain experience with mitigation strategies, leading to new expectations for commodity production practices.
- Positive transformational effects on a region: for example, successful GHG reduction strategies are mimicked across the larger region, leading to 'scaled up' mitigation.
- Positive transformational effects on sectoral business practices: for example, bond-financed initiatives can test novel land use methods at scale and pave the way for broader application.

Mitigation in forestry can result from changes in management that protect existing carbon stocks, encourage further carbon sequestration, and reduce net GHG emissions. Investable assets commonly include land, machinery, equipment, inputs, information systems (e.g. weather; soil and plant analysis), risk monitoring and early warning systems (e.g. fire, drought, pest / disease outbreaks, illegal incursion), and other technologies.

Supporting activities can include strategies that increase productivity on an area basis, while maintaining or increasing carbon stocks, as well as strategies that reduce soil erosion and loss of trees to stressors (e.g. fire, drought, disease).

Activities with potential to reduce net GHG emissions commonly include: afforestation, reforestation, sustainable forest management projects, and set-asides of areas with high carbon stocks. Natural ecosystem protection and restoration can include strategies that protect areas with high carbon stocks or the potential to release significant GHG emissions if disturbed. It can also include remediation or rehabilitation of degraded areas as well as reduction of illegal logging or land conversion.

#### 4.1.3 Greenhouse gas calculations for Forestry

The mitigation component of several other Climate Bonds Sector Criteria is set through a GHG threshold. If the operating emissions of a project or asset fall below the GHG threshold they pass the mitigation component requirements, otherwise the bond fails to be certified. The Transport, Geothermal and Buildings Criteria all operate with GHG thresholds for their mitigation components. The application of this approach to the Forestry Criteria would require the establishment of a GHG emissions reduction target and would require issuers to complete GHG emissions accounting.

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The implications of requiring bond issuers to demonstrate achievement of net GHG emissions reduction above an established threshold was carefully considered during the Criteria development process through the review of the possible approaches and mitigation potential of different technologies, regions, asset classes, and activity types. It was concluded that it is impractical to identify mitigation benchmarks that can be universally applied given the significant variations among areas, practices, and technologies and given the lack of emissions reporting currently happening in the sector. Setting a universal threshold for net GHG reduction would be arbitrary and would likely exclude a wide array of valuable land use investments.

Instead, screening criteria should be used to identify low carbon and climate resilient activities for Certification. One option for achieving this is to set a minimum relative threshold for mitigation (e.g., 20% reduction in tCO<sub>2</sub>eq from a BAU baseline) or requiring only net positive mitigation effect (i.e., net GHG emissions reduction).<sup>51</sup>

However, even with the application of a relative benchmark or threshold, the task remains complicated. Mitigation opportunities in the forestry sector are widely distributed around the globe and the set of investments that could meaningfully contribute to avoiding dangerous climate change is diverse. The amount of feasible GHG emissions reduction varies due to factors such as inherent biophysical conditions, land use history, available technology, and management interventions. For any given bond issuer, GHG reduction potential will be further influenced by the set of assets and activities under their operational control as well as regulatory and market context.

A systematic evaluation was undertaken of various approaches for confirming that use of certified bond proceeds delivered an appropriate level of ambition relative to the global climate change challenge. The following key aspects were taken into consideration:

- **Technological potential:** While it is possible to define absolute thresholds for GHG mitigation potential for renewable energy generation and other sectors for which technology is a key driver, nothing similar exists for mitigation in forestry. Mitigation in forestry occurs through deployment of a diverse array of management practices and technologies (often in unique combinations) in extensive landscapes.
- **Region:** While it is possible to define 'top performers' on a jurisdictional or regional basis for low-carbon buildings, for example, this approach does not translate well to forestry because of the extreme heterogeneity of soil type, land use history, micro-climate, size of land management units, land use drivers, and many other variables that have meaningful influence on GHG emissions reduction potential.
- **Activity type:** Setting mitigation benchmarks for different forestry activity types including those with different levels of permanence (e.g., avoided fire, sequestrations) was another potential option for consideration.<sup>52</sup> However, it was determined that, while many different forestry activities can deliver meaningful GHG mitigation, the volume will be highly contingent on specific conditions. Also, optimal management often involves careful selection of a mix of practices based on specific site conditions and management objectives.

<sup>51</sup> It is possible that bond issuances will support activities or infrastructure that are not 'additional' (i.e., would have been implemented through some other form of financing in the absence of the CBI-labeled bond). This is not necessarily a problem since green bonds are simply intended to steer capital toward environmentally beneficial initiatives as an alternative to other financial opportunities. Green bonds do not carry the same 'additionality' expectation as do REDD or other offset schemes.

<sup>52</sup> See approaches used in carbon offset markets: [www.comet-planner.com](http://www.comet-planner.com)

Based on the above, it is not feasible to identify a meaningful relative threshold for mitigation that would be broadly relevant. While sensible in concept, in practice this would quickly become impractical or impossible given the very high diversity of forestry activities and geographic contexts.

Additionally, GHG emissions calculations are recognised to be expensive and time consuming to do and are not common practice, especially by smaller forestry operators. If compliance is too time consuming or expensive, it is likely that issuers will opt out of Climate Bonds Certification and a careful balance of effectiveness and feasibility is required within the Criteria. This led to the Criteria being underpinned by an approach relying on the identification of management practices that indicate that a forestry asset or project will lead to carbon sequestration and be climate resilient. If an issuer is conducting GHG emissions calculations for their forestry project it would be worth disclosing this to investors as an indication of best practice beyond the requirements of the Criteria.

These requirements vary depending on the type of forestry being practiced and are presented in Section 4 of this document alongside discussion of each respective forestry type.

#### 4.1.4 Definitions and key terms

##### Natural vs. Native

The terms 'natural' and 'native', despite being commonly used terms in the context of sustainable forestry (particularly for conservation and restoration projects) are often misunderstood or used interchangeably and can lead to ambiguity in defining and thus certifying climate aligned and resilient projects.

The TWG discussions concluded that for the purposes of the Forestry Criteria, the term 'natural' would be favoured over 'native'. Native implies that there must be some definition of species that are supposed to be in a location in the absence of disturbance. There are habitats whose present vegetation and species have been there for relatively long periods yet are not considered 'native'. This leads to questions on how far back a species should be present in a habitat or ecosystem to be defined as 'native'.

The term 'natural' can also be subjective, but is less problematic. The term 'natural' is most relevant in the requirements for plantation forestry. Specifically, the Criteria require that there has been 'no natural landscape conversion since 2010'. A definition of natural landscape was then determined through evaluating external definitions used by reputable organisations involved in forestry. These included the FAO, OECD and IUCN.

##### Natural

The following definition was drafted:

*Natural landscape: An area with many of the principal characteristics and key elements of anthropogenically-undisturbed ecosystems, such as complexity, structure and biological diversity, including soil characteristics, flora and fauna, in which a significant portion of species are indigenous, and where there has been continuity of ecological processes over a significant time period. In the case of forests, they are not used for plantation.*

Climate Bonds acknowledges the ambiguity inherent in any definition of natural landscape, and efforts were made to therefore avoid usage of this term wherever possible throughout the Criteria.



## Smallholder

Defining smallholders for the purposes of these Criteria is also critical in order to avoid ambiguity and subjectivity in applying requirements that differ for large-scale foresters and smallholders. The FSC definition of smallholder is adopted.

An appropriate definition for smallholder, especially when setting a hectare threshold, can differ considerably between countries. For example, in African countries a smallholding is accepted to be less than 10ha, while in Brazil, smallholding can be up to 1000ha<sup>53</sup>. For certain jurisdictions FSC provides tailored definitions of smallholders.

The Forestry Criteria set an overarching smallholder definition based on the FSC's definition and leverage the country level definitions available in FSC's Small and Low Intensity Managed Forests<sup>54</sup> where they are available. In the instance that a project in a country that does not have a specific definition of a smallholding size, the overarching definition is to be used.

For the purposes of these Criteria, smallholders will be defined as either:

1. A forest management unit that is under 100ha<sup>55</sup>
2. A forest that is being managed for the production of non-timber forest products (NTFP) only<sup>56</sup>
3. Where the rate of timber harvesting is less than 20% of the mean annual increment within the total production forest area of the unit and the harvest from the total production forest area is less than 5000m<sup>3</sup>/year<sup>57</sup>
4. A forest management unit that complies with the FSC SLIMF Eligibility Criteria - Addendum FSC-STD-01-003a EN

### 4.1.5 Disclosure

In bond markets, issuers are generally not required to be explicit in their use of proceeds. The Climate Bonds Standard is a pioneering effort to promote transparency on intended use of proceeds and independent review of proceeds management, thereby holding issuers accountable for activities and outcomes. Disclosure on use of proceeds is an important factor for all sectors that green bonds are issued in. For that reason the requirements around disclosure are stipulated in the Climate Bonds Standard<sup>58</sup> and not the Sector Criteria and no additional disclosure requirements have been added to the Forestry Criteria specifically<sup>59</sup>. However, the Forestry Criteria do stipulate disclosure items that are best practice to disclose and that investors are interested to see disclosed (see section 4.8).

### 4.1.6 Leveraging existing best practice standards

In all Climate Bonds Standard Sector Criteria development, the aim is to leverage existing work as far as possible. This is in recognition of the fact that significant industry efforts have been directed

<sup>53</sup> FSC SLIMF Eligibility Criteria - Addendum FSC-STD-01-003a EN

<sup>54</sup> <https://ic.fsc.org/en/for-business/fsc-tools/certifying-small-forests>

<sup>55</sup> FSC Standard, SLIMF Eligibility Criteria (FSC-STD-01-003 (Version 1-0) EN)

<sup>56</sup> Ibid

<sup>57</sup> Ibid

<sup>58</sup> <https://www.climatebonds.net/standard/download>

<sup>59</sup> The requirements of the Climate Bonds Standard can be found here:  
[https://www.climatebonds.net/standards/standard\\_download](https://www.climatebonds.net/standards/standard_download)



toward designing and implementing best practice certification schemes. To do this, the requirements of the Sector Criteria must first be set. Once they have been established, external schemes are evaluated against these requirements to ascertain if they are worth leveraging.

See section 4.6 for an explanation of the evaluation carried out and the decision about which certification schemes to leverage in the Forestry Criteria.

#### 4.1.7 National legislation and regulation

Legislation on forestry operations in many countries is strong, comprehensive, and in line with the requirements of the Criteria. In these cases, and where legislation is properly enforced, it could be inferred that all forestry operations in these countries are eligible for Climate Bonds Certification. To validate this, a comprehensive review of legislation, enforcement, and practice would be required on a country by country basis. This is a significantly time consuming process and outside of the remit and capacity of the Climate Bonds Standard. Instead, a more practical approach of setting common requirements that apply across asset types and geographies has been adopted. However, an issuer or verifier may use compliance with national legislation as part of their evidence base to demonstrate that specific requirements stipulated by the Criteria have been met.

#### 4.1.8 Soil carbon

The impact of maintaining and improving soil carbon on climate change mitigation is widely recognised and is a crucial consideration for all types of forestry, including commercial activities and conservation & restoration activities. However, currently we lack a robust way to measure soil carbon. In lieu of a more direct methodology, the Criteria have defined requirements around a soil management plan being in place. This plan must consider several aspects of soil health, such as soil retention, soil structure, productivity, soil biomass and soil carbon. This requirement is detailed in the management plan (for further details see section 4.4)

#### 4.1.9 Genetically Modified Organisms (GMO)

While the use of GMO can be contentious, it is not a climate issue and the remit of these Criteria is to stipulate requirements that ensure the performance of assets and projects is aligned with limiting warming to 2°C. Secondly, GMO is not a significant issue in the forestry sector. Notwithstanding, it is worth noting that FSC<sup>60</sup> and PEFC<sup>61</sup> both prohibit the use of GMO so by default all the projects and assets that must hold either FSC or PEFC certification to achieve Climate Bonds Certification will not use GMO.

#### 4.1.10 Fire management

Forests are vulnerable to climate change related increases in fire risk. Forest fires have terrible impacts on the carbon sequestration potential of forestry; fires release large amount of CO<sub>2</sub> emissions during burning and it takes forests considerable time to recover and regrow. Such risks

<sup>60</sup> Forest Stewardship Council, FSC International Standard, FSC Principles and Criteria for Forest Stewardship, FSC-STD-01-001 V52 EN

<sup>61</sup> PEFC International Standard, Requirements for Certification Schemes, Sustainable Forest Management – Requirements, PEFC ST 1003:2010

may be mitigated by adaptive actions like salvaging dead timber, landscape planning to minimize fire damage, and adjusting fire management systems.

Fire regimes affecting forested areas are shifting due to climate change and issuers should demonstrate that bond-financed assets and activities evaluate fire risks. They should ensure that risks are not only mitigated but that assets and activities do not further exacerbate or increase fire-related risks. For example, afforestation of former pasture lands should ensure that the species mix is appropriate to current and projected climatic conditions and are unlikely to become fuel for fires.

#### 4.1.11 Protection of water resources

The forestry sector is deeply intertwined with water resources, either utilising them directly in harvesting, processing or transport, or through the proximity of forests to important aquatic ecosystems such as rivers or lakes. Equally, forests are closely linked to important hydrogeological processes such as soil stability. Poor practices in forestry can pose high risks to water resources and can lead to issues such as soil erosion and pollution of watercourses, groundwater and riparian areas. These are key concerns for the resilience of forestry projects and the Criteria include a requirement to address water resource management and protection of riparian areas in the management plan section of the Forestry Criteria (see section 4.4).

In addition, it is important to note that any forestry assets or projects implemented solely to improve, restore or regenerate watersheds, water networks or drainage systems are eligible for Certification under the Water Criteria<sup>62</sup> and not the Forestry Criteria.

#### 4.1.12 Illegal logging

The Criteria address the protection of forests from illegal deforestation and degradation. Illegal deforestation poses a significant problem particularly in tropical regions. It is a source of carbon emissions and reduces the sequestration capacity of forests, while negatively impacting biodiversity and the other ecosystem services that forests provide.

Illegal logging can be carried out by a variety of actors and in all types of forestry. As such, forestry protection is required for each type of forestry that the Criteria cover.

Requirements for forest protection and monitoring are included in the Criteria in through the management plan. The management plan contains a specific requirement (see section 4.4) regarding forest protection. The Criteria do not stipulate specific monitoring and protection measures. Rather, it is up to the project proponents to select and demonstrate that adequate monitoring and protection measures have been planned and are in place to prevent illegal logging and deforestation. This allows flexibility for forestry practitioners to employ the most effective and appropriate approaches for monitoring and protection.

It is important to note that adequate monitoring and protection measures are valuable proxies for ensuring a consistent increase in carbon stocks. This, alongside requirements for no natural landscape conversion and good management, justifies the absence of a greenhouse gas assessment requirement.

<sup>62</sup> Full details of the Water Criteria can be found here: <https://www.climatebonds.net/standard/water>

#### 4.1.13 Application of the Forestry Criteria to different issuer types

The Forestry Criteria have been developed to accommodate different types of issuers. Analysis of the needs, capacities and requirements of potential issuers led to the identification of two groups that may need slightly altered requirements; these include smallholders and banks looking to refinance a pool of loans made to forestry operators.

Smallholders make up a significant portion of the forestry sector. However, smallholder forestry is considerably different from large-scale forestry for multiple reasons such as size of forest concessions, access to finance and technology and level of education. These differences are addressed in the Criteria.

The requirements for plantation forestry and sustainable forest management lean heavily on projects or assets being either FSC- or PEFC-certified (see section 4.6). However, requiring compliance with these certification bodies poses an unrealistic requirement for many smallholders as they often lack the organisational structure to go through the process of certification required for either of these schemes. Yet smallholder projects without FSC or PEFC certification may still be low carbon and climate resilient.

Therefore, for smallholders, the Forestry Criteria only require compliance with the management plan (see section 4.4). In summary, FSC or PEFC certification is not required by smallholders, but all other requirements set out in the Forestry Criteria apply to smallholders.

Banks seeking to refinance loans made to forestry operators may also have difficulty in meeting the Forestry Criteria requirements due to lack of access to information. Most banks do not have access to information about the management of the forests and, especially if loans have already been made, cannot go back to the operator to request more information. The Criteria however do not make any concessions to account for this. Without compliance with all requirements it is not possible to be sure that a forest project or asset is delivering positive mitigation and resilience benefits.

These Criteria should act as a guide to banks and other users about the type of information and questions that need to be captured and evaluated ahead of giving loans and making investments. The vision is that the Forestry Criteria will help to incentivize banks to seek more information before they make new loans in the future.

#### 4.1.14 Evidence using satellite imagery

Most components of the Forestry Criteria require reporting regarding forest cover. For example, plantation forestry must be able to show that no natural landscape was converted after 2010, while conservation projects must demonstrate that forest cover is being maintained, and restoration projects must demonstrate that forest cover is increasing.

The use of satellite imagery for demonstrating compliance with these requirements is acceptable within the Criteria. Extensive and sufficiently accurate coverage exists globally for satellite imagery and presents a feasible option that is relatively easy to use and at a reasonable cost, especially when compared to field-based verification conducted by forest managers or other parties, which can be extremely costly and time-consuming. Moreover, satellite imagery is continuously improving and being updated, making the global coverage more accurate.

Limitations of satellite imagery were considered including that an actively managed forest can appear the same as a cleared or degraded forest on satellite imagery. Issuers will have to provide

supplementary information to the comfort of the verifier if this is the case.

Other forms of evidence, such as field verification, may also be provided to show compliance with the requirements in the Forestry Criteria. The verifier will make a judgement about whether this is sufficient to prove compliance and may request additional information from the issuer if necessary.

## 4.2 Mitigation Requirements

Mitigation requirements for the Forestry Criteria have been set depending on forestry type. The following sections give the requirements separately for plantation forestry, sustainable forest management, non-timber forest products (NTFP), conservation and restoration, supply chain and forest roads.

If a bond contains plantation forestry projects and sustainable forest management projects, for example, the plantation forestry projects must comply with the plantation requirements and the sustainable forest management projects must comply with the sustainable forest management requirements. This holds for any bond with any mixture of project or asset types.

### 4.2.1 Plantation Forestry

Plantation forestry is not always compatible with climate change mitigation. Land conversion from natural landscape to plantation forestry can result in large GHG emissions and badly managed plantations will not achieve the carbon sequestration that they could. As a result, plantation forestry assets and projects seeking Climate Bonds Certification must comply with requirements and are not considered low carbon or climate resilient by default.

Ensuring plantation forestry is carbon sequestering

The aim of the Climate Bonds Certification is to only certify projects and assets that result in emissions reductions and increase resilience. The obvious way to ensure that a project is carbon sequestering is to require a GHG assessment to be carried out. However, several factors precluded the adoption of a GHG assessment requirement. First, GHG assessments are not currently common practice in this sector, second, they can be prohibitively expensive, and third, the TWG members were confident that simpler and less expensive compliance requirements could be set (see section 4.1.3).

Factors that would make a forestry project GHG emitting rather than GHG sequestering were flagged and analysed while setting up the Criteria and included the following:

- Land use change is often the reason that plantation forestry projects end up being GHG emitting
- Maintaining the health of the forest stands will boost the carbon sequestered by the forest
- A forest that is not well protected or managed to prevent degradation or destruction (for example from illegal logging or forest fires) is at high risk of causing GHG emissions

No natural landscape conversion since 2010

The Forestry Criteria require that no conversion from natural landscape to plantation forestry has taken place since 2010. Land use change directly affects the exchange of GHGs between terrestrial ecosystems and the atmosphere. Clearing forest and other natural landscape results in large emissions and the mitigation potential of commercial plantation forestry would not outweigh these

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emissions, not to mention the biodiversity and ecosystem services losses associated with losing natural landscapes.

It was important to ensure that forestry practitioners do not convert an area of natural landscape to a plantation and receive Certification. However, it was recognised that plantation forestry on previously converted natural landscape should not be entirely restricted from achieving Certification. For areas of natural landscape that were converted some time ago it can be beneficial, from a mitigation and resilience perspective, to establish plantation forestry.

The Criteria stipulate a cut-off year of 2010, after which no conversion of natural landscape to plantation forestry is acceptable. 2010 was chosen as it was deemed sufficiently long ago so as not to allow Certification of any recently converted land or create perverse incentives. FSC states a land conversion cut-off year of 1994, while PEFC states a cut-off year of 2010. It was also considered that by setting the cut-off year at 2010, holding either FSC or PEFC certification would show compliance. 2010 is a fixed cut-off year and, at present, there is no intention to move that date forward in future iterations of the Forestry Criteria. Smallholders must comply with the same conversion year deadline.

The requirement described above, 'no conversion of natural landscape since 2010', requires a definition of natural landscape. This is discussed fully in section 4.7 but to summarise: natural landscape that is not to be converted is defined for the purposes of these Criteria as High Carbon Stock (HCS) land and peatland.

Projects and assets certified by FSC and PEFC will have already had to comply with roughly the same rule to gain certification (see Appendix 2). The exception is that neither FSC nor PEFC are explicit that peatlands must not be converted to plantation forestry. FSC does provide recommendations regarding conversion of peatlands in its International Generic Indicators<sup>63</sup>:

However, this principle has not yet been adopted into FSC's overarching standard and as such is not a formal part of the FSC International Standard.

The Forestry Criteria exclude any forestry projects that involve planting of forests on peatlands, to reflect the importance of maintaining peatlands from a climate change mitigation perspective. Peatlands can vary in their vegetation cover, with extensive forest ecosystems being found on peat soils, as well as sparser vegetation types so they are not necessarily always recognised in the HCS approach. Extensive peat swamps and forests are mainly found in tropical regions with high rainfall, where the risk of deforestation is also high. Because peatland soils are extremely rich in carbon and play important roles as carbon sinks, deforestation and subsequent planting of plantation forests on peatlands carries particularly high climate risk.

## Resulting Criteria

<sup>63</sup> Forest Stewardship Council, International Generic Indicators, FSC-STD-60-004 V1-0 EN, Principle 5:1

Requirement 1: Mitigation component			
Component	Requirement	Demonstration of compliance	
Mitigation	No natural landscape conversion since 2010	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certification plus confirmation that no peatlands have been converted since 2010</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certification plus confirmation that no peatlands have been converted since 2010</li> </ul> OR <ul style="list-style-type: none"> <li>Satellite evidence that all plantations were established before 2010</li> </ul> OR <ul style="list-style-type: none"> <li>Evidence that converted land does not fall into the Forestry Criteria's definition of natural landscape</li> </ul>
	Carbon stocks of forests or other habitats are maintained through good management practices	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certified</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>Comply with the management plan (see section 4.4)</li> </ul>

Requirement 2: Resilience component			
Component	Requirement	Demonstration of compliance	
Resilience	Impacts that climate change may cause to the resilience of the forest, land or surrounding ecosystem are understood and mitigated	<ul style="list-style-type: none"> <li>Must comply with the adaptation and resilience checklist (see section 4.3)</li> </ul>	
	General health of forests or other habitats is maintained through good management practices	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certified</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>Comply with the management plan (see section 4.4)</li> </ul>

Requirement 3: FPIC		
Component	Requirement	Demonstration of compliance
Free, Prior and Informed Consent	FPIC must be sought when property rights are potentially affected or projects may lead to the removal or relocation of habitation or activities	<ul style="list-style-type: none"> <li>Comply with a recommend best practice scheme (see section 4.5)</li> </ul>

## Key

 Compliant

 Not compliant

 Certifiable

 Not certifiable

## 4.2.2 Sustainable Forest Management

The requirements specified under the sustainable forest management section of the Forestry Criteria apply to the commercial sustainable management of natural forests to produce timber (the full scope of this section is given in Table 3). Advocating commercial use of natural forest can be controversial as it is seen in some cases to threaten natural ecosystems and biodiversity. However, if done right it



can boost carbon sequestration, biodiversity and the ecosystem services provided by the forest.<sup>64</sup> <sup>65</sup> Moreover, sustainable forest management often helps to protect primary forest by giving it a value that relies on the health and ecosystem being maintained, thus incentivizing the protection, management and maintenance of the forest.

It is important to allow Certification for sustainable forest management given that a large portion of commercial forestry takes place in natural forests, rather than plantations. By setting requirements, these Criteria give incentives for sustainable forest management projects seeking finance to be aligned with best practice. The requirements safeguard that sustainable forest management for commercial purposes is promoting a carbon sequestering, thriving and resilient ecosystem both within the actual projects and assets themselves and more broadly in the wider ecosystem.

Ensuring sustainable forest management is carbon sequestering and resilient

The development of the Forestry Criteria involved the evaluation of a range of methodologies, standards, and practices to assess their applicability to the Criteria. This included the potential to leverage practices such as Reduced Impact Logging and Sustainable Logging to certify projects and assets. However, these practices and techniques do not have set parameters that must be adhered to or any sort of verification scheme associated and were thus unviable proxies.

The option for an outright exclusion for logging in primary forest was also considered, but was rejected given that the Criteria need to be globally applicable. While excluding logging in primary forest may make sense in European countries it is not appropriate for South America or Africa. Instead, the Criteria sets requirements that ensured logging is done in a positive way.

The major factors that can affect the carbon sequestering and resilience of sustainably managed forests is poor management and inadequate protection of the forest stands. The management plan has been designed with this specifically in mind.

As with all other types of forestry covered by these Criteria they must also comply with the adaptation and resilience checklist. It is not necessary to require compliance with the 'no conversion from natural landscape' requirements for sustainable forest management projects and assets, like it is for plantation forestry projects and assets, because activities are being carried out in the natural landscape.

Resulting criteria

See diagram on next page.

<sup>64</sup> FAO (2010), Managing forests for climate change, available here: <http://www.fao.org/docrep/013/i1960e/i1960e00.pdf> (accessed on 12/09/2018)

<sup>65</sup> Nature (2014), Carbon sequestration: managing forests in uncertain times, available here: <https://www.nature.com/news/carbon-sequestration-managing-forests-in-uncertain-times-1.14687> (accessed on 12/09/2018)

Requirement 1: Mitigation component			
Component	Requirement	Demonstration of compliance	
Mitigation	No natural landscape conversion since 2010	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certification plus confirmation that no peatlands have been converted since 2010</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certification plus confirmation that no peatlands have been converted since 2010</li> </ul> OR <ul style="list-style-type: none"> <li>Satellite evidence that all forests were established before 2010</li> </ul> OR <ul style="list-style-type: none"> <li>Evidence that converted land does not fall into the Forestry Criteria's definition of natural landscape</li> </ul>
	Carbon stocks of forests or other habitats are maintained through good management practices	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certified</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>Comply with the management plan (see section 4.4)</li> </ul>

Requirement 2: Resilience component			
Component	Requirement	Demonstration of compliance	
Resilience	Impacts that climate change may cause to the resilience of the forest, land or surrounding ecosystem are understood and mitigated	<ul style="list-style-type: none"> <li>Must comply with the adaptation and resilience checklist (see section 4.3)</li> </ul>	
	General health of forests or other habitats is maintained through good management practices	For non-smallholders: <ul style="list-style-type: none"> <li>FSC or PEFC certified</li> </ul>	For smallholders: <ul style="list-style-type: none"> <li>Comply with the management plan (see section 4.4)</li> </ul>

Requirement 3: FPIC		
Component	Requirement	Demonstration of compliance
Free, Prior and Informed Consent	FPIC must be sought when property rights are potentially affected or projects may lead to the removal or relocation of habitation or activities	<ul style="list-style-type: none"> <li>Comply with a recommend best practice scheme (see section 4.5)</li> </ul>

## Key

 Compliant

 Not compliant

 Certifiable

 Not certifiable

### 4.2.3 Non-Timber Forest Products (NTFP)

The production of non-timber forest products (NTFP) occurs in all types of forestry; plantation, sustainable forest management and conservation and restoration forestry.

The scope of the Forestry Criteria therefore encompass NTFP as well as timber. The Criteria stipulate that as long as the forest in which the NTFP are being collected is in compliance with the

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relevant requirements (i.e. the plantation forestry requirements if NTFP are being collected in a plantation) then the projects or assets related to NTFP should also be eligible for Certification.

A global standard specific to NTFPs does not yet exist due to the variety of categories NTFPs can fall into with different parts of the plant being used depending on the species. Any future standards developed that fill this gap will be evaluated to determine their suitability for use in these Criteria.

## Resulting Criteria

For NTFP to be eligible for certification the forest in which the products are collected must comply with the relevant forest type requirements.

For NTFP products harvested from:

- Plantations see section 4.2.1 for the relevant requirements
- Sustainable forest management see section 4.2.2 for the relevant requirements
- Conservation or restoration forestry see section 4.2.4 for the relevant disclosure requirements

### 4.2.4 Conservation & Restoration of Forests and Non-forested Land

Conservation and restoration of both forested and non-forested land refers to non-commercial activities that aim to preserve or improve the forested or non-forested habitat (more details on the scope in section 3.2, Table 4). These activities may also be included in a bond alongside commercial activities or in bonds coming from development banks or sovereigns.

Conservation and restoration projects have the potential to be beneficial both from a mitigation and a climate change resilience standpoint. However, if projects are inappropriate for the location, not well managed or not properly planned they will not deliver mitigation and resilience. Therefore, the Forestry Criteria aim to ensure Certification is only awarded to projects that are strong on both the mitigation and the resilience fronts.

The requirements for conservation and restoration focus on two key areas:

- Ensuring restoration and conservation projects meet a minimum requirement to show they are beneficial from a mitigation and resilience perspective
- Preventing arrested succession of conservation and restoration projects

Conservation & restoration projects are not required to comply with the 'no conversion from natural landscape since 2010' because they aim to enhance or restore natural landscapes. Instead a minimum threshold for certification analyses whether the habitat is appropriate for the location.

Minimum threshold for Certification of conservation and restoration projects

The Certification of projects that have a conservation and restoration label but in practice are not actually maintaining or restoring a valuable habitat is specifically avoided in the Forestry Criteria. Inappropriate habitat can detrimentally affect the resilience of the projects itself and the wider system so it is an important consideration for the Climate Bonds Forestry Criteria. Therefore, a minimum starting point is required.

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The Forestry Criteria adopt the Ecoregion Approach<sup>66</sup>. Ecoregions are defined geographical units, developed as part of an initiative by WWF along with academic institutions and researchers. WWF defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions". These units recognise the unique biodiversity and interactions between species in all areas of the globe and importantly the types of species that are typically found in each ecoregion. Ecoregions are the results of regional analyses of biodiversity across the globe, completed in collaboration with regional experts and by conducting extensive literature reviews.

The Ecoregion Approach utilises ecoregion classifications developed by WWF<sup>67</sup> to determine species and species mixtures suitable to a given area. It is granular enough to provide global coverage of any area, and furthermore provided adequate information regarding appropriate species. An issuer would thus have to prove that they are conserving or restoring species that are in line with their location's Ecoregion classification to receive Certification. Promoting natural habitats can inherently provide long-term benefits to emissions mitigation as well as considerable adaptation and resilience benefits by ensuring thriving and resilient ecosystems.

Because small areas of forest can be very important for the overall resilience of an ecosystem and a small per cent of proceeds in a very large bond can equate to a large area of forest, the Ecoregion Approach is the most appropriate tool to use as it is based on the quality of the forestry project itself.

Ecoregions are classified by WWF and various other academic institutions and experts and therefore rely on these bodies and sources to carry out updates to reflect any biogeographical changes to a given Ecoregion. Therefore, when Ecoregion classifications are updated, the Criteria for Conservation & Restoration of Forests and Non-Forested Land will reflect this.

#### Avoiding arrested succession in restoration and conservation projects

The Forestry Criteria aim to avoid arrested succession in conservation and restoration projects. Arrested succession refers to the prevention of climax vegetation from developing. In relation to climate change mitigation this would mean a habitat is prevented from reaching its carbon sequestration potential. In extreme cases, reverse succession can occur where a habitat starts to become degraded.

Adhering to the management plan (see section 4.4) ensures that arrested succession is not a concern for restoration and conservation projects. It indicates that there is proactive management of the forest or other habitat taking place.

#### Invasive species vs. suitable species

One requirement that is particularly pertinent for conservation and restoration of forestry and non-forested land in the management plan regards the selection of suitable species (see section 4.4). The types of projects and assets that must meet this requirement are conservation and restoration forestry and non-forested projects and smallholders who are not FSC- or PEFC-certified. The Forestry Criteria aim to prevent unsuitable species being introduced so that genetic diversity and appropriate ecological conditions are maintained.

<sup>66</sup> Ecoregion descriptions can be found here: <https://www.worldwildlife.org/biome-categories/terrestrial-ecoregions>

<sup>67</sup> WWF's shapefile can be found here: <https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world>

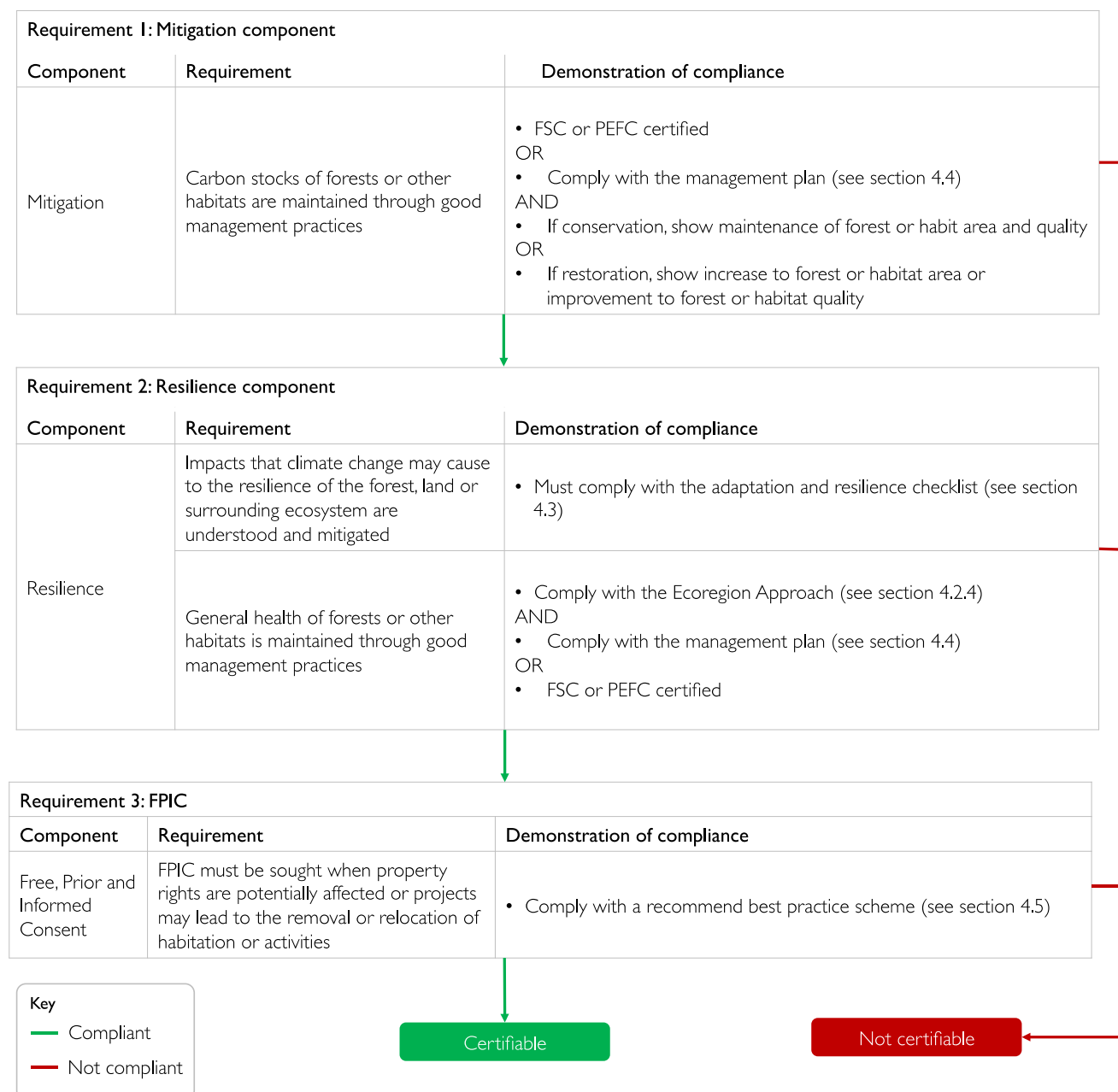
This requirement specifies 'suitable species selection' to comprehensively reflect the types of species selection that needs to take place in forestry projects. For example, having a requirement for invasive species would not necessarily accommodate projects such as smallholder forest plantations, as they may involve the planting of trees that are not technically 'native' and thus could be considered 'invasive'.

Placing invasive species as the focus of this requirement implies that the only way to maintain genetic diversity and ecological integrity is by preventing any non-native species introduction. However, simultaneously promoting species suitable for that habitat, whether native or not, would ensure and imply that the forestry practitioner is considering a wider range of ecological factors rather than simply avoiding the introduction of invasive species.

Extending the conservation and restoration requirements to cover non-forested land

Given there are areas where forests are not the natural ecosystem, the Criteria allow for the Certification of conservation and restoration of landscapes other than forest. The requirements laid out for conservation and restoration forestry are equally applicable to forested and non-forested land. Therefore, both are within scope.

Resulting Criteria



#### 4.2.5 Supply Chain and supporting infrastructure

Supply chain assets and operations are essential to value addition, profitability, and re-investment in forestry and, therefore, key to climate compatible forestry management. Efficient supply chains can improve productivity, minimize raw material use, reduce post-harvest loss, improve energy and water use efficiency. Storage, processing and other supply chain facilities are likely to be important in future bond issuances as these represent large, investable assets. Bond issuers may seek to finance new or upgraded supply chain assets and operations or to refinance existing investments. This could encompass establishing, upgrading, extending or maintaining facilities necessary for:

- Input supply (e.g., tree nurseries; delivery and quality assurance mechanisms)
- Storage (e.g., storage depots; dedicated warehousing)

Supported by:



- Transport (e.g., on concession vehicles)
- Primary processing (e.g., milling) and packaging of processed products

The Forestry Criteria aims to recognise this and allow Certification for the necessary supporting infrastructure and supply chain as well as the actual forestry projects and assets themselves, as without the supporting infrastructure the forests are often not viable or cannot be maintained or managed. However, including necessary supporting infrastructure in a Certified Climate Bond without having to meet any additional requirements could be problematic if some of the supply chain or supporting infrastructure are particularly energy intensive, for example.

### Scope of supply chain

The decisions made on scope are fully presented in Table 4 but broadly the scope was decided to cover:

- Nurseries or seed orchards
- Storage facilities
- Monitoring and assessment equipment
- Solid wood production
- Veneer and plywood production
- Saw mills
- Stud mills
- Reconstituted panels: fibreboard, particleboard, MDF and OSB
- Pulp production
- Paper and board manufacture

Fertiliser production facilities are considered out of scope. This fully discussed in section 3.3.2.

### Best practice certification and supply chain

Where FSC and PEFC are already being leveraged this stays the case for the related supply chain. Both FSC and PEFC have chain of custody certification. To achieve FSC or PEFC certification a facility must show that it has proper processes in place to keep certified wood separate from non-certified wood so that there is no mixing. For this reason, these Criteria specify that all inputs must hold FSC or PEFC certification and the facility itself must be certified by either FSC or PEFC.

### Considerations for supply chain assets

Certain supply chain assets, particularly pulp & paper manufacture facilities and sawmills, can be very polluting. However, requiring them to hold either FSC or PEFC certification will mean that they have had to comply with best practice requirements in this regard so there shouldn't be a need for any additional requirements here.

FSC and PEFC certification do not account for how energy intensive facilities are, something the Climate Bonds Forestry Criteria is particularly concerned with given the focus on climate change mitigation and resilience. The manufacturing aspects of the supply chain are where these concerns arise. Therefore, this applies to veneer and plywood production, reconstituted panels, pulp production and paper and board manufacture.

Despite the high-energy needs of these types of facilities, they often use a considerable amount of renewable energy. This generally comes from the waste material that is created in the wood or pulp manufacture process. The decision was to stipulate a minimum per cent of the energy used that

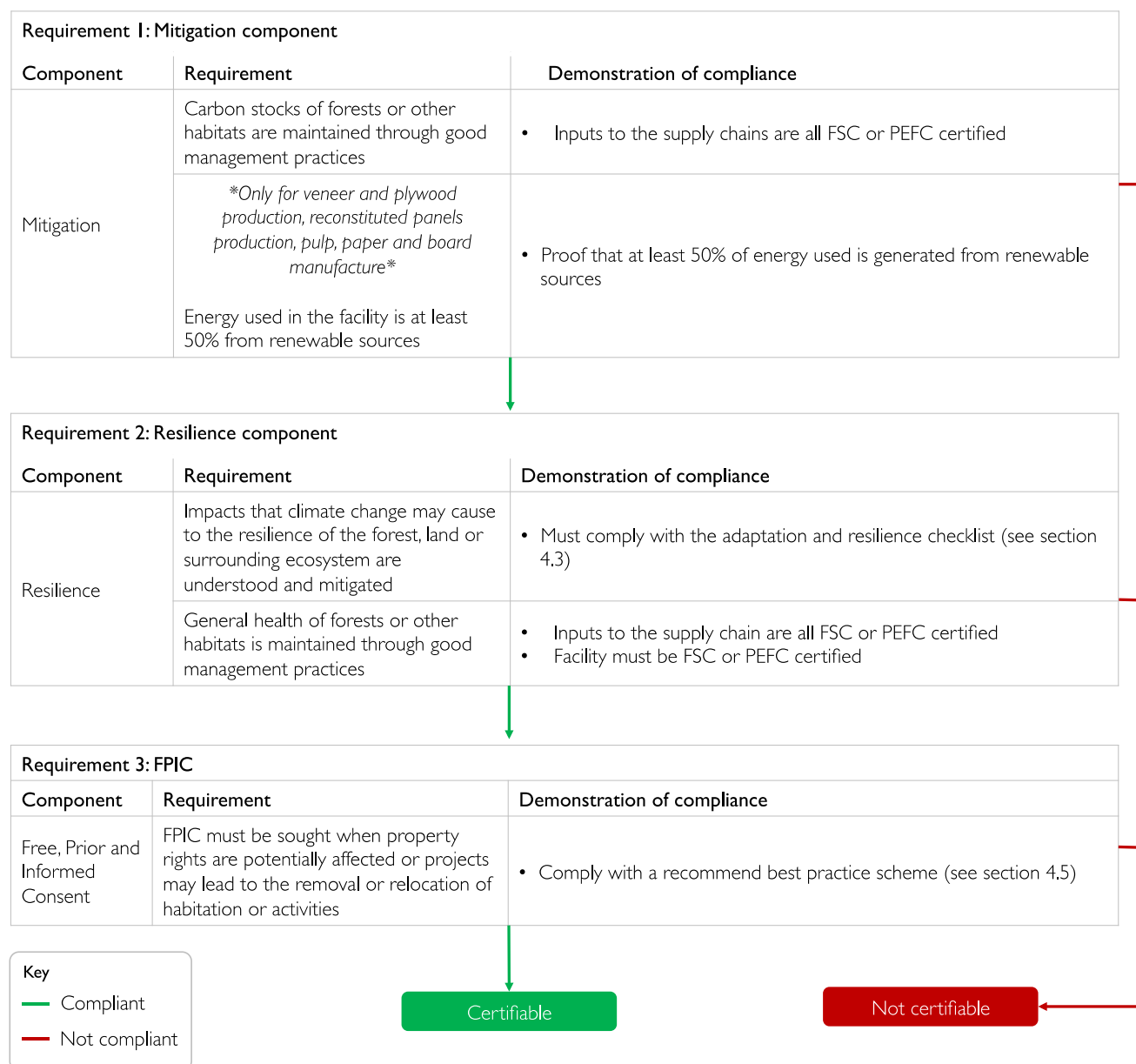
Supported by:

must be generated from renewable energy or waste to energy.

Restricting the Certification of paper & pulp manufacture to residual wood products only is highly impractical, given that paper & pulp is a much better alternative to plastic production. In future iterations of the Criteria it may be reconsidered whether to only allow Certification for paper & pulp manufacture from residuals.

## Resulting criteria

See diagram on next page.



## 4.2.6 Forest roads

There are arguments for and against forest roads being aligned with low carbon and climate resilient Supported by:

forest projects. Generally, the Climate Bonds Standard explicitly excludes roads as eligible use of proceeds because they support the use of fossil fuel vehicles. However, in the case of forestry, the argument is more nuanced.

Roads are a crucial piece of supporting infrastructure. Forestry projects without suitable roads in the forestry concession would likely experience significantly higher damage during regular management and harvesting, as the machinery would have to clear its own path through the forest. This would potentially require greater fuel usage than if a road was in place, leading to increased fossil fuel emissions. But, roads increase access to forests and can enable illegal logging and forest degradation. And, if poorly built, roads can lead to soil erosion and disrupt watercourses.

Forest roads can be one of the large infrastructure costs a forestry project must finance. Excluding roads from the scope of these Criteria could significantly discourage potential issuers from seeking Certification. Therefore, forest roads are eligible use of proceeds under the Forestry Criteria, but additional requirements must be met if they are included in a bond seeking Climate Bonds Certification.

FSC and PEFC have guidelines relating to the construction, management and monitoring of forest roads.<sup>68</sup> These are to minimise any adverse environmental impacts roads might have including the possibility of increasing illegal logging. Supplementary guidelines provide more specific strategies for certificate holders to carry out these requirements<sup>69</sup>. Moreover, illegal deforestation and protection against it is also acknowledged by FSC and PEFC.

## Resulting Criteria

1. Road is contained within the forestry concession  
AND
2. The forestry concession must comply with the relevant requirements (i.e. if the road is in a plantation forest then the forest must comply with the requirements set for plantation forestry)  
AND
3. Road must not pass through an Intact Forest Landscape (IFLs).<sup>70</sup> It can be verified whether the road will pass through an IFL using the map shapefile available online<sup>71</sup> <sup>72</sup>  
AND, 4 OR 5
4. Projects and assets are FSC or PEFC certified  
OR
5. Road is designed and managed considering:
  - a. Soils are protected
  - b. Water courses are protected
  - c. Disturbance of and damage to rare and threatened species, habitats, ecosystems and landscape values are prevented, mitigated or repaired
  - d. Measures are in place to prevent unauthorised vehicle access into the forest stands

<sup>68</sup> PEFC International Standard criterion 5.3.8, 5.4.11, 5.5.1, 5.5.5 contain stipulations about forest roads. FSC has requirements in Annex 2, Annex 3, guide for SLIMS, Scale, Intensity and Risk Guideline for Standard Developers and FSC guidelines for the implementation of FPIC

<sup>69</sup> <https://ic.fsc.org/en/document-center/id/59>, <https://ic.fsc.org/en/document-center/id/106>, <https://ic.fsc.org/en/document-center/id/105>, <https://ic.fsc.org/en/document-center/id/67>

<sup>70</sup> An Intact Forest Landscape is a seamless mosaic of forest and naturally treeless ecosystems within the zone of current forest extent, which exhibit no remotely detected signs of human activity or habitat fragmentation and is large enough to maintain all native biological diversity, including viable populations of wide-ranging species. See more here: <http://www.intactforests.org/>

<sup>71</sup> <http://www.intactforests.org/data.ifl.html>

<sup>72</sup> [https://www.globalforestwatch.org/map/3/-16.58/138.54/ALL/grayscale/loss,forestgain/607?tab=analysis-tab&begin=2001-01-01&end=2017-01-01&threshold=30&dont\\_analyze=true](https://www.globalforestwatch.org/map/3/-16.58/138.54/ALL/grayscale/loss,forestgain/607?tab=analysis-tab&begin=2001-01-01&end=2017-01-01&threshold=30&dont_analyze=true)

### 4.3 Adaptation & Resilience Requirements

The IPCC defines adaptation as: *“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.”* (IPCC, 2014a).

The IPCC defines resilience as: *“The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.”* (IPCC, 2014a). Capacity for adaptation and for resilience will depend on available assets and their distribution within a population as well as institutional infrastructure.

All forest systems are likely to be influenced by climate change, with impacts on profitability, resource supply, and government budgets. Maintaining and enhancing productivity of forested landscapes will increasingly require strategic investments to promote adaptation capacity and resilience. This should be of immediate interest to governments developing and implementing economic frameworks for natural resource management, and to farsighted forest asset owners and managers concerned about long-term profitability and revenue predictability. To counteract material impacts of climate change on businesses operating within the forestry sector, investments to promote adaptation capacity and resilience are likely to be necessary.

Adaptation and resilience interventions are likely to vary by region, but could include<sup>73</sup>:

- Introducing new plant varieties (e.g., that have a higher drought tolerance, or that are less susceptible to pests and diseases likely to be exacerbated because of climate change);
- Installing and upgrading enhanced systems for observation and early warning (e.g., weather information systems);
- Facilitating changes in practices (e.g., providing training and inputs to enable forest managers to implement sustainable, climate-smart management);
- Establishing wildfire management systems by providing equipment, early warning systems, and training;
- Creating infrastructure to reduce post-harvest losses and waste (e.g., building storage facilities);
- Protecting or enhancing natural buffers in coastal and riverine zones (e.g., mangroves, sea grass, corals) and restoring wetlands to reduce impacts of sea level rise, flooding, storm events;
- Introduce new techniques to restored wetlands (e.g., reed or Alder wood as a renewable resource) to keep them in production while saving the carbon stock;
- Creating micro-credit and insurance mechanisms to help landowners and land users cope with extreme events;
- Promoting the increase in carbon sinks, e.g., in protecting primary forests and peatlands, supporting increase in woody biomass growth, and promoting long-lived, recycled Harvested Wood Products (HWPs);
- Adapting trade finance and working capital provision so that it facilitates improved management along supply chains, and;
- Consulting and utilising climate modelling when designing forestry or land management plans

<sup>73</sup> Additional interventions are suggested in FAO. 2011.

The Forestry Criteria have established a process-based approach to checking that projects and assets are climate resilient. The Forestry Criteria interpret climate resilient to mean that projects and assets will remain operational and economical despite the changing climate. Issuers may wish to include additional impact metrics and are free to do so, including, for example, metrics on habitats, species conserved or biodiversity impact. Any such disclosure would be treated as additional information available to investors and would not be within scope of the checks done by the Climate Bonds Approved Verifier.

Bond issuers can refer to national-level adaptation planning to understand major opportunities and constraints for forestry projects in the regions where they operate. Under the UNFCCC, fifty Least Developed Countries (LDCs) have submitted National Adaptation Programmes of Action (NAPAs), which address urgent and immediate adaptation needs.<sup>74</sup> A number of countries have developed National Adaptation Plans (NAPs), which are intended to encourage integrated development and cross-sector planning to address medium- to long-term climate change threats to socio-economic security and progress.<sup>75</sup> Other countries have submitted adaptation components in National Communications to the UNFCCC<sup>76</sup> or developed climate resilience strategies and regional initiatives.<sup>77</sup>

Noting that FSC and PEFC address many factors of resilience but are less robust with regard to climate related risks, the Forestry Criteria are particularly comprehensive in this area. However, it is not a simple matter to set resilience enhancement targets. A process-oriented approach for the resilience and adaptation components of the Forestry Criteria is applicable to all types of forestry and it is a requirement that all types of forestry must meet the resilience checklist to be awarded Climate Bonds Certification.

## Resulting Criteria

*Table 6: The adaptation and resilience checklist for evaluating compliance with the Forestry Criteria*

	Item	Demonstration of compliance
Section 1: The future climate change related risks and vulnerabilities to the asset/site have been evaluated		
1.1	<p>Processes are in place to assess key risks from a changing climate, both to the asset itself, AND to the broader ecosystem<sup>78</sup></p> <p>Examples of risks that may need to be evaluated are:</p> <ul style="list-style-type: none"> <li>• Temperature changes</li> <li>• Changes to water availability</li> <li>• Increased risk of flooding or drought</li> <li>• Changes to wind patterns</li> </ul>	<p>For example: management plan, fire management plan, environmental impact assessment or adaptation plan. Existing, authoritative and</p>

<sup>74</sup> [http://unfccc.int/adaptation/workstreams/national\\_adaptation\\_programmes\\_of\\_action/items/4585.php](http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/4585.php)

<sup>75</sup> Kissinger et al. 2014.

<sup>76</sup> UNFCCC National Communications: [http://unfccc.int/national\\_reports/items/1408.php](http://unfccc.int/national_reports/items/1408.php)

<sup>77</sup> Regional plans include the European Climate Adaptation Platform: <http://climate-adapt.eea.europa.eu/countries>, other nations have specific strategies, e.g., USDA 2014 Climate Change Adaptation Plan: [http://www.usda.gov/oce/climate\\_change/adaptation/adaptation\\_plan.htm](http://www.usda.gov/oce/climate_change/adaptation/adaptation_plan.htm) Preventionweb provides a useful overview of national focal points on adaptation: <http://www.preventionweb.net/english/hyogo/national/list/>

<sup>78</sup> Risks that the asset poses to the resilience of the broader ecosystem or local stakeholders might include any ways in which forestry activities might affect the resilience of other users/stakeholders or any ways in which forestry activities improve the adaptation capacity or resilience of other users/stakeholders. For example, does the asset impact water availability in the entire ecosystem?

	<ul style="list-style-type: none"> <li>Increased fire risk</li> <li>Impact on water quality and quantity for other users in the basin</li> </ul> <p>Areas that are felt to be of concern for the operation of these assets should be evaluated.</p> <p>This process should include:</p> <ul style="list-style-type: none"> <li>Mapping of risks; where, when, severity and likelihood. This may be a quantitative or qualitative mapping of risks</li> <li>Linking the risk to the possible impact on the asset and ongoing operations – e.g. impact on operating feasibility, harvesting or yield, or impact on maintenance requirements<sup>79</sup></li> </ul> <p>These processes and assessments should use existing, authoritative and peer reviewed analyses or reports such as the Intergovernmental Panel on Climate Change's most recent Assessment Report, National Adaptation Strategies and/or Action Plans, National Adaptation Programmes of Action, Nationally Determined Contributions, Strategic Programmes for Climate Resilience and other relevant adaptation strategies and policies and academic journals.</p> <p>An appropriate timescale over which climate change impacts are assessed should be established. To assess the climate change signal above observed climatic variability, the characteristics of future climate should be assessed over a period of at least 20 years.</p>	peer reviewed analyses that have been used must be cited.
Section 2: A plan has been designed and implemented to mitigate and adapt to the climate risks and vulnerabilities identified and to improve the resilience of the assets		
2.1	<p>A <a href="#">plan has been designed and is being implemented</a> to address the risks identified in 1.1.</p> <p>A link between the risks identified in section 1.1 and the planning and design of the risk mitigation or adaptation measures should be articulated.</p> <p>The expected benefits of recommended measures should be explained.</p> <p>Examples of measures to address risks identified might be:</p> <ul style="list-style-type: none"> <li>There are training, capacity and governance arrangements in place for how the organization will deal with the impacts of exceptional events such as droughts, floods, wildfires, severe pollution</li> <li>Tree species that are appropriate for the expected changes in climate, as well as for the current climate have been selected</li> <li>There is a programme of stakeholder engagement and collaboration to strengthen resilience outcomes across the system (e.g. policy development, consultation and collaboration to ensure connectivity of green nodes, of supply chain actors, or neighbours in same ecosystem)</li> </ul>	For example, adaptation plan, management plan
Section 3: There is a plan in place to re-evaluate the risks climate change poses		
	<p>Re-evaluation should be carried out annually.</p> <p>Re-evaluation of adaptation or resilience plans and measures, as specified in 2.1, is also planned.</p> <p>There are monitoring and reporting systems and processes in place to identify high risk scenarios and to identify when unexpected risks are likely.</p>	

## 4.4 Management plan

The management plan of the Forestry Criteria defines what good management in relation to achieving carbon mitigation and climate resilience is. Development of the management plan began by outlining all the aspects that would ideally be managed in a forestry project. This was then paired back to those that are crucial for ensuring that a project or asset is low carbon and climate resilient:

- Soil health

<sup>79</sup> This list taken from World Banks Climate and Disaster Risk Assessment Tool



- Water management
- Fire management
- Riparian areas protection
- Biodiversity management
- Species selection

The management plan will apply to all types of forestry projects and assets. For certain forestry activities, FSC or PEFC certification will be taken as a proxy to show that the management plan has been complied with (see section 4.6). For forestry activities that are not required to show FSC or PEFC certification, the issuer will have to provide evidence to the verifier that assets or projects are in compliance with the management plan.

## Resulting criteria

Table 7: The management plan of the Forestry Criteria

Requirements of the management plan	
1.	<u>Soil health</u> : a soil management plan is developed and implemented with a focus on soil carbon, productivity, retention of soil, retention of soil biomass and soil structure
2.	<u>Water management</u> : there has been an assessment done of the water requirements of the forests, impacts on and water needs of downstream users (both human and natural) and discharges into watercourses. A water management plan is in place that addresses relevant risks and includes measures to protect ground water and local water bodies
3.	<u>Fire management</u> : measures have been developed and are implemented for the prevention of destructive forest fires (i.e. fires that do not serve management purposes) <sup>80</sup>
4.	<u>Riparian areas protection</u> : provision has been made to protect riparian areas
5.	<u>Biodiversity management</u> : the management plan includes provisions for managing and maintaining biodiversity
6.	<u>Species selection</u> : selection of species that are suitable for the project type (e.g. conservation, restoration or sustainable forest management), will not disrupt genetic diversity or that are suitable for current or projected future ecological conditions
7.	<u>Chemical use</u> : prohibition of active ingredients that are listed in the Stockholm Convention, the Rotterdam Convention or that are listed as classification Ia or Ib in the WHO recommended Classification of Pesticides by Hazard, except in case of an emergency situation or a governmental order. In these cases, environmental and social risk assessment is required.
8.	<u>Forest protection</u> : protection and monitoring measures are in place to prevent and monitor for illegal logging and illegal land conversion.

## 4.5 Free, Prior & Informed Consent (FPIC) Requirement

Generally, Free, Prior & Informed Consent (FPIC) is considered outside the strict climate change scope that we set for the Climate Bonds Standard Criteria. However, in the case of the Forestry Criteria, due to the nature of the assets being so interlinked with surrounding communities, the Forestry Criteria do have a requirement that FPIC is carried out.

### Resulting Criteria

Free, prior & informed consent (FPIC) from affected indigenous peoples or local communities must be sought when:

<sup>80</sup> This is not meant to address the possible increased fire-proness due to climate change. The resilience checklist covers that part of fire management.

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- Property rights are potentially affected, FPIC must be obtained from property rights holders; or
- Project activities may lead to the removal or relocation of habitation or activities important to their culture and livelihood

FPIC must be carried out in accordance with one of the following:

- ILO 169
- FSC
- Climate, community and biodiversity standard
- PEFC
- UN Declaration of the Rights of Indigenous Peoples
- FAO's FPIC Manual for Practitioners
- HVC-HCSA Assessment

It is the issuers responsibility to provide information about which FPIC guidance has been followed and evidence that the guidelines have been adhered to.

#### 4.6 Leveraging Existing Certification Schemes

In all Climate Bonds Standard Sector Criteria, the aim is to leverage existing schemes and initiatives that are in use in the sector in question. This is because:

- Significant industry effort has already gone towards designing and implementing these schemes
- Many have been through multi-stakeholder development processes and periods of public consultation
- It is very likely that some established schemes and initiatives check similar requirements to those that the Climate Bonds Standard Forestry Criteria require are fulfilled

To determine which existing schemes can be leveraged as showing compliance with parts of the Forestry Criteria, the schemes must be evaluated against the requirements of the Forestry Criteria. Schemes are leveraged if they are compliant with most of the Forestry Criteria requirements. Projects or assets seeking certification via a recognised best practice standard will still have to comply with the areas of the Forestry Criteria requirements that the best practice does not cover. Table 8 shows the criteria that external best practice schemes are evaluated against.

Table 8: Evaluation criteria for external best practice schemes

Forestry Criteria Requirements
No natural landscape conversion since 2010 - any forestry projects converting natural landscapes since 2010 onwards cannot be certified
Soil health – a soil management plan is developed and implemented. Includes consideration of soil carbon, productivity, retention of soil, retention of soil biomass and soil structure
Water management – there has been an assessment done of the water requirements of the forests, impacts on and water needs of downstream users (both human and natural) and discharges into watercourses. A water management plan is in place that addresses relevant risks and includes

measures to protect ground water and local water bodies	
Fire management – measures have been developed and are implemented for the prevention of destructive forest fires (i.e. fires that do not serve management purposes) <sup>81</sup>	
Riparian areas protection – provision has been made to protect riparian areas	
Biodiversity management – provision has been made for managing and maintaining biodiversity	
Species selection – no introduction of invasive species that may disrupt genetic diversity or that are not suitable for current or projected future ecological conditions	
Chemical use – prohibition of active ingredients that are listed in the Stockholm Convention, the Rotterdam Convention or that are listed as classification Ia or Ib in the WHO recommended Classification of Pesticides by Hazard, except in case of an emergency situation or a governmental order. In these cases, environmental and social risk assessment is required.	
Forest protection – protection and monitoring measures are in place to prevent and monitor for illegal logging and illegal land conversion.	
Resilience checklist	1. Future climate change related risks and vulnerabilities to the asset/site have been evaluated
	2. A plan has been designed and implemented to mitigate and adapt to the climate risks and vulnerabilities identified and to improve the resilience of the assets
	3. There is a plan in place to periodically re-evaluate the risks climate change poses
<b>Governance Requirements</b>	
Multi-stakeholder involvement in standard development process	
Scientific input in development of standard	
Transparency in public reports and communication of the standard	
Complaints and appeals process is in place	
Regular reviews and revisions of the standard	
Training of auditors	
Training opportunities for users of the standard	
Audits required	
Sanction mechanisms in place	

Governance is evaluated because it is essential that the Climate Bonds Standard only leverages well-run, transparent and trustworthy schemes and initiatives.

Using the above approach, several best practice schemes were evaluated and the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) have been identified as industry best practice certification bodies to be leveraged by the Forestry Criteria. Both have large global coverage of the forestry sector, have standards that comprehensively cover forestry and its associated sub-sectors, and effectively promote sustainable forestry. Though these certification schemes are not perfect in terms of ensuring high-production, sustainable forestry, with each having their own unique drawbacks, they are the best existing schemes with global coverage. Important to also note is FSC's and PEFC's good track record regarding grievances and complaints resolution.

Gaps between the Forestry Criteria requirements and FSC's and PEFC's requirements were identified and issuers are required to comply with these in addition to showing FSC or PEFC certification. The full evaluation of both schemes against the requirements in Table 7 is available in Appendix 2. Other certification schemes may be leveraged in future revisions of these Criteria provided they pass through a similar evaluation.

<sup>81</sup> This is not meant to address the possible increased fire-proness due to climate change. The resilience checklist covers that part of fire management.

The main area of the Forestry Criteria that FSC and PEFC do not cover is the resilience checklist. While both certification schemes cover it to some extent they do not specifically require that future climate changes are considered. This is a fundamental part of the Forestry Criteria resilience checklist, so issuers will have to give supporting evidence to show it has been complied with.

It is also worth noting that leveraging PEFC and FSC certification brings a host of other checks to forestry projects that would normally be outside the remit of the Climate Bonds Certification. For example, FSC has requirements for compliance with law, workers' rights, employment conditions, indigenous peoples' rights and community relations, all of which are outside the scope of the requirements set under the Climate Bonds Standard but are certainly beneficial safeguards.

All plantation and sustainable forest management projects, except smallholder projects, are required to hold FSC or PEFC certification as part of their compliance with the Forestry Criteria. Smallholders that do not hold PEFC or FSC certification must instead prove compliance with the management plan (see section 4.4). Issuers must disclose the expiry date and any corrective action requests, past or pending, that have been issued by the certification body.

By leveraging FSC and PEFC, Climate Bonds Initiative is not commenting that these standards are of equal value. The opinion expressed is that they have checks in sufficient areas to be worth leveraging as a proxy for compliance with some parts of the Forestry Criteria (see Appendix 2 for the full evaluation).

#### 4.7 High Conservation Value-High Carbon Stock Assessments (HCV-HCSA)

HCV-HCS assessments<sup>82</sup> are leveraged for use in the Forestry Criteria, with regards to smallholders projects complying with the requirement that no natural landscape has been converted since 2010.

Use of this approach is required for issuers that are not required to be FSC or PEFC certified but do need to comply with the requirements of 'no natural landscape conversion since 2010'. Two categories of land have been identified where the Criteria prohibit land use change; High Carbon Stock (HCS) land and peatlands. The HCV-HCSA has six classifications of land; high density forest, medium density forest, low density forest, young regenerating forest, scrub and open land<sup>83</sup>. The first four classes are considered HCS land, however for the Forestry Criteria it is stipulated that scrub should not be converted to plantation forestry because it can have high soil carbon that should be protected. Hence, the resulting requirement was set that the only land that is acceptable to convert to plantation forestry since 2010 is open land (if it is not peatland).

To determine which HCS category land falls into the HCV-HCSA should be used. The toolkit is designed to standardise the methodology and to make it available to all practitioners.<sup>84</sup>

#### 4.8 Best Practice for Disclosure

Beyond the disclosure requirements already stipulated within the Climate Bonds Standard, the Forestry Criteria do not require the issuer to disclose supplementary information to receive certification. Nonetheless, all Criteria under the Climate Bonds Standard (including the Forestry

<sup>82</sup> <http://highcarbonstock.org/>

<sup>83</sup> <http://highcarbonstock.org/the-hcs-approach-toolkit/>

<sup>84</sup> The HCS Approach Toolkit Version 2.0: Putting no Deforestation into Practice (2017) <http://highcarbonstock.org/the-hcs-approach-toolkit/>

Criteria) seek to promote and encourage best practice of disclosure of any project information available publically and particularly to the investor. In following best practice disclosure guidelines, issuers are demonstrating to the market that they are following pioneering practices of transparency and management of proceeds. Therefore, in the case of the Forestry Criteria, while not compulsory, the issuer is encouraged to disclose information on the following:

- GHG emission footprint – including quantification, methodology used and performance over the lifetime of the bond
- Species planted and used – species names of all trees to be planted including whether the species are native to the location or not
- Genetically Modified (GM) plants – whether GM trees are to be planted and harvested and, if so, details regarding these trees
- Percentage of unconverted or conserved land – whether a mixed forestry project comprised of plantation and conservation forestry or solely conservation forestry, an issuer can disclose the percentage of each within a project
- Supply chain assets – issuers are also encouraged to disclose any operational safeguards that may be in place
- Impact assessments, external audits and ESG safeguards – relevant assessments and audits carried out separately to those required in the Criteria are welcomed
- Broader benefits of the project for the surrounding ecosystems and unconverted and conserved land
- Medium to long-term investment plans
- Past or pending litigation concerning land rights, livelihood or health issues related to stakeholders, and any remedial action

## 4.9 Reporting requirements

Reporting on the use of proceeds for a Certified Climate Bond is required at three stages:

1. Pre-issuance – before issuing the bond the issuer must engage with the verifier to confirm use of proceeds are aligned with the requirements of the Climate Bonds Standard
2. Post-issuance – after issuing the bond the verifier confirms that use of proceeds, once allocated, remain aligned with the requirements of the Climate Bonds Standard and Forestry Criteria
3. Annual reporting – the issuer must prepare a simple report each year for the term of the bond to confirm that use of proceeds are aligned with the requirements of the Climate Bonds Standard and the Forestry Criteria

The above are the overarching reporting requirements as laid out in the Climate Bonds Standard<sup>85</sup>. This is to both prove compliance and to promote stronger disclosure of use of proceeds from issuers.

<sup>85</sup> Further information about the Climate Bonds Standard can be found here: [https://www.climatebonds.net/standards/standard\\_download](https://www.climatebonds.net/standards/standard_download)

## Appendix 1: TWG and IWG members

### Members of the Forestry Technical Working Group

- Christine Negra, Versant Vision LLC, Lead Specialist
- Torsten Boettcher, Agrobanco
- Sergio Collaco de Carvalho, University of Oxford, Geography Department
- Paul Chatterton, WWF International
- Stuart Clenaghan, EcoSystem Service Ltd
- Rupert Edwards, Forest Trends
- David Ganz, RECOFTC
- Michele Laird, Abt Associates
- Petri Lehtonen, Indufor

### Members of the Land Use Technical Working Group

- Christine Negra, Versant Vision LLC, Lead Specialist
- Tanja Havemann, Clarmondial AG, Lead Specialist
- Keith Alverson, UNEP
- Geoff Blate, USDA Forest Service
- Rupert Edwards, Forest Trends
- Martial Bernoux, French Research Institute for Development (IRD)
- Adam Chambers, USDA NRCS-National Air Quality and Atmospheric Change Team
- Paul Chatterton, WWF International
- Jane Feehan, European Investment Bank
- David Ganz, RECOFTC
- Mark Holderness, Global Forum on Agricultural Research
- David Howlett, Global Resilience Partnership
- Frank Hicks, Independent advisor
- Henry Neufeldt, (formerly) World Agroforestry Center (ICRAF)
- Mark New, African Climate and Development Initiative, University of Cape Town
- Simon Petley, EnviroMarket Ltd.
- Roseline Remans, Bioversity International, CGIAR
- Lamon Rutten, Independent Consultant
- Brett Shields, Spatial Informatics Group (SIG) and Asia LEDS Global Partnership
- Naomi Swickard and Jerry Seager, Verified Carbon Standard (VCS)
- Annette Thiele, University Greifswald, Partner in the Greifswald Mire Centre
- Raylene Watson, Independent Consultant

### Members of the Forestry Industry Working Group

- Michael Anderson, ERM
- Sophie Beckham, International Paper
- Jean-Dominique Bescond, World Bank
- Brian Kernohan, Hancock Natural Resources Group
- Sami Lundfren & Tim Lehesvirta, UPM
- Lars Mac Key, DanskeBank
- Jacob Michelsen, Nordea
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- Mark Robinson, DNV.GL

Supported by:





### Members of the Land Use Industry Working Group

- John Tobin & Fabian Huwyler, Credit Suisse
- Hans Biemans & Justin Sherrard, Rabobank
- Marc Sadler, World Bank
- Brian Kernohan, Hancock Natural Resources Group
- Ali bin Mohamed, Hassad Foods
- Howard-Yana Shapiro, Mars / UC Davis
- Oli Haltia, Dasos Capital
- Tim McGavin, Laguna Bay
- Karla Canavan
- Esben Brandi, Quantum Global
- Marcos Mancini, Banorte
- Cristiano Oliveria, Fibria
- Mads Asprem, Green Resources
- Chris Brown, Olam
- Andrew Voysey, Cambridge Institute for Sustainable Leadership
- Jason Green, ECOM Trading
- Lara Yacob, The Nature Conservancy
- John Simpson, Duxton Asset Management
- Katalin Solymosi, IADB
- Timm Tennigkeit, UNIQUE
- Michael Hendriksz, ADM
- Stephen McDowell, Barclays
- Rishi Madlani, Royal Bank of Scotland
- Caroline Cruickshank, Emma Wilkes & Jamie Bartlett, Bank of New York Mellon

## Appendix 2: Evaluation of best practice standards

TABLE 8. Evaluation table of FSC requirements against the requirements of the Climate Bonds Standard Forestry Criteria

Evaluation Criteria	Evidence of FSC meeting requirement
Forestry Criteria requirements	

Supported by:



<p>No natural landscape conversion since 2010 - any forestry projects converting natural landscapes since 2010 onwards cannot be certified</p>	<p>FSC International Standard, Principle 6:</p> <p>6.9: 'The Organization shall not convert natural forest to plantations, nor natural forests or plantations on sites directly converted from natural forest to non-forest land use, except when the conversion:</p> <ul style="list-style-type: none"> <li>• affects a very limited portion of the area of the Management Unit, and</li> <li>• will produce clear, substantial, additional, secure long-term conservation benefits in the Management Unit, and</li> <li>• does not damage or threaten High Conservation Values, nor any sites or resources necessary to maintain or enhance those High Conservation Values.'</li> </ul> <p>6.10: 'Management Units containing plantations that were established on areas converted from natural forest after November 1994 shall not qualify for certification, except where:</p> <ul style="list-style-type: none"> <li>• clear and sufficient evidence is provided that The Organization was not directly or indirectly responsible for the conversion, or</li> <li>• the conversion affected a very limited portion of the area of the Management Unit and is producing clear, substantial, additional, secure long-term conservation benefits in the Management Unit.'</li> </ul> <p>FSC-STD-01-001 V 5-2, Glossary of Terms:</p> <p>Natural forest: A forest area with many of the principal characteristics and key elements of native ecosystems, such as complexity, structure and biological diversity, including soil characteristics, flora and fauna, in which all or almost all the trees are native species, not classified as plantations.</p> <p>'Natural forest' includes the following categories:</p> <ul style="list-style-type: none"> <li>• Forest affected by harvesting or other disturbances, in which trees are being or have been regenerated by a combination of natural and artificial regeneration with species typical of natural forests in that site, and where many of the above-ground and below-ground characteristics of the natural forest are still present. In boreal and north temperate forests which are naturally composed of only one or few tree species, a combination of natural and artificial regeneration to regenerate forest of the same native species, with most of the principal characteristics and key elements of native ecosystems of that site, is not by itself considered as conversion to plantations.</li> <li>• Natural forests which are maintained by traditional silvicultural practices including natural or assisted natural regeneration.</li> <li>• Well-developed secondary or colonizing forest of native species which has regenerated in non-forest areas.</li> <li>• The definition of 'natural forest' may include areas described as wooded ecosystems, woodland and savanna.</li> </ul> <p><u>*FSC International Standard and subsequent principles does not yet address peatlands in terms of conversion. However, wetlands are described. Peatland conversion is directly addressed in the FSC International Generic Indicators document but this is not included as a direct requirement in the FSC international Standard*</u></p>
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	<p>Summary:</p> <p>FSC certification plus confirmation that no peatlands have been converted since 2010 will satisfy the Climate Bonds Standard Forestry Criteria for this requirement</p>
Soil health – a soil management plan is developed and implemented with a focus on soil carbon, productivity, retention of soil, retention of soil biomass and soil structure	<p>FSC International Standard, Principle 9:</p> <p>9.1: 'High Conservation Value (HCV) 4 - Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.'</p> <p>FSC International Standard, Principle 10:</p> <p>10.6: [Any use of fertilisers] ... 'prevent, mitigate, and/or repair damage to environmental values, including soils.'</p> <p>10.10: 'The Organization shall manage infrastructural development, transport activities and silviculture so that water resources and soils are protected...'</p> <p>Glossary of Terms – 'Ecosystem Services', includes:</p> <p>c) 'supporting services such as soil formation and nutrient cycling'</p> <p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
Water management – there has been an assessment done of the water requirements of the forests, impacts on and water needs of downstream users (both human and natural) and discharges into watercourses. A water management plan is in place that addresses relevant risks and includes measures to protect ground water and local water bodies	<p>FSC International Standard, Principle 6:</p> <p>6.7: 'The Organization shall protect or restore natural water courses, water bodies, riparian zones and their connectivity. The Organization shall avoid negative impacts on water quality and quantity and mitigate and remedy those that occur.'</p> <p>FSC International Standard, Principle 9:</p> <p>9.1: 'HCV (High Conservation Value) 4 - Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.'</p> <p>9.1, HCV 5 – 'Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.) ...'</p> <p>FSC International Standard, Principle 10:</p> <p>10.10: 'The Organization shall manage infrastructural development, transport activities and silviculture so that water resources and soils are protected...'</p> <p>Glossary of Terms – 'Connectivity':</p> <p>'Aquatic connectivity deals with the accessibility and transport of materials and organisms, through groundwater and surface water, between different patches of aquatic ecosystems of all kinds'</p> <p>Glossary of Terms – 'Ecosystem Services', includes:</p>

	a) provisioning services such as food, forest products and water
	<p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
<p>Fire management – measures have been developed and are implemented for the prevention of destructive forest fires (i.e. fires that do not serve management purposes)</p>	<p>FSC-STD-01-001 V 5-2</p> <p>6.2 Prior to the start of site-disturbing activities, The Organization* shall identify and assess the scale, intensity and risk* of potential impacts of management activities on the identified environmental values*.</p> <p>6.3 The Organization* shall identify and implement effective actions to prevent negative impacts of management activities on the environmental values*, and to mitigate and repair those that occur, proportionate to the scale, intensity and risk* of these impacts (<i>addresses intentional fires as a management activity</i>)</p> <p>1.4 The Organization* shall develop and implement measures, and/or shall engage with regulatory agencies, to systematically protect the Management Unit* from unauthorized or illegal resource use, settlement and other illegal activities (<i>addresses intentional, illegal fire</i>)</p> <p>10.9 The Organization* shall assess risks and implement activities that reduce potential negative impacts from natural hazards proportionate to scale, intensity, and risk*. (<i>addresses prevention and impact mitigation of natural fires</i>)</p> <p>FSC-STD-01-001 V 5-2, Glossary of Terms:</p> <p>Natural Hazards: disturbances that can present risks to social and environmental values* in the Management Unit* but that may also comprise important ecosystem functions; examples include drought, flood, fire, landslide, storm, avalanche, etc.</p> <p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
<p>Riparian areas protection – provision has been made to protect riparian areas</p>	<p>FSC International Standard, Principle 6:</p> <p>6.7: 'The Organization shall protect or restore natural water courses, water bodies, riparian zones and their connectivity. The Organization shall avoid negative impacts on water quality and quantity and mitigate and remedy those that occur'</p> <p>Glossary of Terms – 'Connectivity':</p> <p>'Aquatic connectivity deals with the accessibility and transport of materials and organisms, through groundwater and surface water, between different patches of aquatic ecosystems of all kinds'</p>

	<p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
Biodiversity management – provision has been made for managing and maintaining biodiversity	<p>FSC International Standard, Principle 6:</p> <p>6.6: ‘The Organization shall effectively maintain the continued existence of naturally occurring native species and genotypes, and prevent losses of biological diversity, especially through habitat management in the Management Unit. The Organization shall demonstrate that effective measures are in place to manage and control hunting, fishing, trapping and collecting.’</p> <p>FSC International Standard, Principle 9:</p> <p>9.1: The Organization, through engagement with affected stakeholders, interested stakeholders and other means and sources, shall assess and record the presence and status of the following:</p> <ul style="list-style-type: none"> <li>• HCV 1 – ‘Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.’</li> <li>• HCV 3 – ‘Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.’</li> </ul> <p><u>*Within the document cited, many definitions and terms are derived from the Convention on Biological Diversity*</u></p>
	<p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
Species selection – no introduction of invasive species that may disrupt genetic diversity or that are not suitable for current or projected future ecological conditions	<p>FSC International Standard Scope:</p> <p>‘The decision [on whether or not a certain vegetation type can be certified] should include consideration of the species involved...’</p> <p>FSC International Standard, Principle 6:</p> <p>6.4: ‘The Organization shall protect rare species and threatened species and their habitats in the Management Unit through conservation zones, protection areas, connectivity and/or (where necessary) other direct measures for their survival and viability... The Organization shall take into account the geographic range and ecological requirements of rare and threatened species beyond the boundary of the Management Unit, when determining the measures to be taken inside the Management Unit.’</p> <p>6.6: ‘The Organization shall effectively maintain the continued existence of naturally occurring native species and genotypes, and prevent losses of biological diversity, especially through habitat management in the Management Unit. The Organization shall demonstrate that effective measures are in place to manage and control hunting, fishing, trapping and collecting’</p> <p>FSC International Standard: Principle 10:</p> <p>10.3: ‘The Organization shall only use alien species* when knowledge and/or experience have shown that any invasive impacts can be controlled and effective mitigation measures are in place’</p>

Supported by:

	<p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
<p>Chemical use – prohibition of active ingredients that are listed in the Stockholm Convention, the Rotterdam Convention or that are listed as classification Ia or Ib in the WHO recommended Classification of Pesticides by Hazard, except in case of an emergency situation or a governmental order. In these cases, environmental and social risk assessment is required</p>	<p>FSC International Standard, Principle 10:</p> <p>10.6: ‘The Organization shall minimize or avoid the use of fertilizers. When fertilizers are used, The Organization shall demonstrate that the use is equally or more ecologically and economically beneficial than the use of silvicultural systems that do not require fertilizers, and prevent, mitigate, and/ or repair damage to environmental values, including soils.’</p> <p>10.7: ‘The Organization shall use integrated pest management and silviculture systems which avoid, or aim at eliminating, the use of chemical pesticides. The Organization shall not use any chemical pesticides prohibited by FSC policy. When pesticides are used, The Organization shall prevent, mitigate, and / or repair damage to environmental values and human health.’</p> <p>The FSC policy on prohibited chemical pesticides bans the use of all pesticides that are banned by any international agreement or listed under Prior Informed Consent (PIC).<sup>86 87</sup></p> <p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>

<sup>86</sup> Review of the Forest Stewardship Council’s Pesticide Indicators and Thresholds, Report by Pesticide Action Network UK for Forest Stewardship Council International Center (2005)

<sup>87</sup> FSC List of ‘highly hazardous’ pesticides, FSC-STD-30-001a EN (2017)



<p>Forest protection – protection and monitoring measures are in place to prevent and monitor for illegal logging and illegal land conversion.</p>	<p>FSC-STD-01-001</p> <p>1.4 The Organization* shall develop and implement measures, and/or shall engage with regulatory agencies, to systematically protect the Management Unit* from unauthorized or illegal resource use, settlement and other illegal activities.</p> <p>1.5 The Organization* shall comply with the applicable national laws*, local laws*, ratified* international conventions and obligatory codes of practice*, relating to the transportation and trade of forest products within and from the Management Unit*, and/or up to the point of first sale.</p> <p>FSC-STD-60-004 V2-0, International Generic Indicators:</p> <p>1.4.1 Measures are implemented to provide protection* from unauthorized or illegal harvesting, hunting, fishing, trapping, collecting, settlement and other unauthorized activities.</p> <p>FSC International Standard, Principle 7:</p> <p>Foreword: 'The management plan shall be implemented and kept up to date based on monitoring information in order to promote adaptive management.'</p> <p>FSC International Standard, Principle 8:</p> <p>8.1 The Organization shall monitor the implementation of its management plan, including its policies and objectives, its progress with the activities planned, and the achievement of its verifiable targets.</p> <p>8.4: 'The Organization shall make publicly available a summary of the results of monitoring free of charge, excluding confidential information.'</p> <p>FSC International Standard, Principle 9:</p> <p>9.4: 'The Organization shall demonstrate that periodic monitoring is carried out to assess changes in the status of High Conservation Values, and shall adapt its management strategies to ensure their effective protection. The monitoring shall be proportionate to the scale, intensity and risk of management activities, and shall include engagement with affected stakeholders, interested stakeholders and experts.'</p> <p>FSC's Policy for Association allows FSC to disassociate from certified companies even if they are not directly but indirectly involved in illegal logging or illegal timber trade and/or these activities take place outside the certified management unit(s). This tool can be applied to companies that are solely chain-of-custody certified.</p> <p>Summary:</p> <p>FSC certification is sufficient evidence that this requirement has been met</p>
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<p>Resilience checklist 1 - Future climate change related risks and vulnerabilities to the asset/site have been evaluated</p>	<p>FSC-STD-60-004</p> <p>6.1 The Organization* shall assess environmental values* in the Management Unit* and those values outside the Management Unit potentially affected by management activities</p> <p>6.1.2 Assessments of environmental values* are conducted with a level of detail and frequency so that: 4) Monitoring of impacts or environmental changes can be conducted as per Principle* 8.</p> <p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are FSC certified.</p>
<p>Resilience checklist 2 - A plan has been designed and implemented to mitigate and adapt to the climate risks and vulnerabilities identified and to improve the resilience of the assets</p>	<p>6.8 The Organization* shall manage the landscape* in the Management Unit* to maintain and/or restore a varying mosaic of species, sizes, ages, spatial scales and regeneration cycles appropriate for the landscape values* in that region, and for enhancing environmental and economic resilience*."</p> <p>7.1 The Organization* shall, proportionate to scale, intensity and risk* of its management activities, set policies (visions and values) and objectives* for management, which are environmentally sound, socially beneficial and economically viable. Summaries of these policies and objectives shall be incorporated into the management plan*, and publicized."</p> <p>10.2 The Organization* shall use species for regeneration that are ecologically well adapted to the site and to the management objectives*. The Organization shall use native species* and local genotypes* for regeneration, unless there is clear and convincing justification for using others." (plus according indicators, and Instructions for standard developers from the IGIs.)</p> <p>10.9 The Organization* shall* assess risks* and implement activities that reduce potential negative impacts from natural hazards* proportionate to scale, intensity, and risk*." (plus according indicators, and Instructions for standard developers from the IGIs)</p> <p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are FSC certified.</p>

Resilience checklist 3 - There is a plan in place to periodically re-evaluate the risks climate change poses	<p>FSC-STD-60-004</p> <p>6.1.2 Assessments of environmental values* are conducted with a level of detail and frequency so that: 4) Monitoring of impacts or environmental changes can be conducted as per Principle* 8.</p> <p>7.4 The Organization shall update and revise periodically the management planning and procedural documentation to incorporate the results of monitoring and evaluation, stakeholder engagement* or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.</p> <p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are FSC certified.</p>
Governance evaluation	
Multi-stakeholder involvement in standard development process	Yes
Scientific input in development of standard	<p>The 'FSC Procedure for the Development and Revision of FSC normative documents' (FSC-PRO-01-001) requires scientific input for normative documents:</p> <p>9.5 The review of the document's continued relevance and effectiveness in meeting the stated objective shall consider the following information:</p> <ul style="list-style-type: none"> <li>a) New or changed legislation or best practices;</li> <li>b) Emerging technologies or scientific knowledge;</li> <li>c) The results of FSC's Monitoring and Evaluation activities, e.g. implementation problems, competitive advantage or threats;</li> <li>d) Evaluation of Change Requests;</li> <li>e) Existing interpretations and Advice Notes to be incorporated.</li> </ul> <p>In addition, scientific research is used in Working Groups and in the standard itself.</p>
Transparency in public reports and communication of the standard	<p>Summary audit reports for forest management are publicly available in one space, the FSC certificates database <a href="http://info.fsc.org">http://info.fsc.org</a>. Audit reports are here available in usually two languages: in the local language and in either English or Spanish.</p>

Complaints and appeals process is in place	<p>All complaints cases are reported and archived on FSC's website, with ongoing cases also reported on.</p> <p>Complaints against certificate holders:</p> <p>Dealt with by the certification body in the first place and can be escalated to the accreditation body and later to FSC. FSC– in its accreditation standard FSC-STD-20-001, section 1.9 – is very specific about the frame for handling complaints. The process is timebound, starting with the initial response to the complainant. The language for handling the complaint must be agreed between both parties and at least offers the two options from the public summary audit reports, which is the local language and one world language, either English or Spanish. This enables not only local but also international stakeholders to file complaints.</p> <p>Complaints against the performance of the certification scheme as such:</p> <p>Managed according to FSC-PRO-01-008 or FSC-PRO-01-005.</p> <p>Complaints against certified or member companies that are linked to unacceptable practices:</p> <p>In FSC, this is described as “Policy for association” (PfA) complaints. The disputes on the FSC website that you refer to in the background document, p 69, are mostly “Policy for association” complaints. The policy for association (FSC-POL-01-004) allows FSC to dissociate from companies with unbearable practices, like involvement in illegal logging etc. Complaints based on the Policy for association are treated according to ‘FSC-PRO-01-009 - Processing PfA Complaints’.</p>
Regular reviews and revisions of the standard	Yes
Training of auditors	Yes
Training opportunities for users of the standard	Yes
Audits required	<p>The FSC system requires field visits to the forest management units of the applicant certificate holders before a certificate can be issued. Nonconformities need to be remedied within a certain timeline (12 months for minor nonconformities, 3 months for majors). If this does not happen, the certificate will normally be suspended. This provides FSC with a tool to enforce certificate holders to put corrective actions in place, and to ensure certificate holders cannot continue with nonconforming practices.</p>
Sanction mechanisms in place	Yes
Other	<p>FSC is registered as an ISEAL member, which means they are committed to ISEAL's Credibility Principles and follow their Codes of Good Practice in setting standards, assuring compliance and monitoring impacts. Organisations become full members by demonstrating full compliance with the ISEAL Standard-setting Code.</p>

TABLE 9. Evaluation table of PEFC requirements against the requirements of the Climate Bonds Standard Forestry Criteria

Evaluation Criteria	Evidence of PEFC meeting requirement
Forestry Criteria requirements	
No natural landscape conversion since 2010 - any forestry projects converting natural landscapes since 2010 onwards cannot be certified	<p>PEFC International Standard:</p> <p>5.1.11: 'Conversion of forests to other types of land use, including conversion of primary forests to forest plantations, shall not occur unless in justified circumstances where the conversion:</p> <ul style="list-style-type: none"> <li>a) is in compliance with national and regional policy and legislation relevant for land use and forest management and is a result of national or regional land-use planning governed by a governmental or other official authority including consultation with materially and directly interested persons and organisations; and</li> <li>b) entails a small proportion of forest type; and</li> <li>c) does not have negative impacts on threatened (including vulnerable, rare or endangered) forest ecosystems, culturally and socially significant areas, important habitats of threatened species or other protected areas; and</li> <li>d) makes a contribution to long-term conservation, economic, and social benefits.' <p>5.1.12: 'Conversion of abandoned agricultural and treeless land into forest land shall be taken into consideration, whenever it can add economic, ecological, social and/or cultural value.'</p> <p>PEFC International Standard, Appendix 1: Guidelines for the interpretation of requirements in the case of plantation forestry:</p> <p>Requirement: '5.1.1. Conversion of forests to other types of land use, including conversion of primary forests to forest plantations, shall not occur unless in justified circumstances where the conversion...'</p> <p>Interpretation for forest plantations: 'The requirement for the "conversion of forests to other types of land use, including conversion of primary forests to forest plantations" means that forest plantations established by a forest conversion after 31 December 2010 in other than "justified circumstances" do not meet the requirement and are not eligible for certification.'</p> <p>Requirements for Sustainable Forest Management in Temperate, Boreal and Plantation Forests - Consultation:</p> <p>'Special key biotopes in the forest such as... wetlands... shall be protected or, where appropriate, restored when damaged by forest practices.'</p> <p><u>*No explicit mention of conversion from peatland*</u></p> </li></ul>

	<p>Summary:</p> <p>PEFC certification plus confirmation that no peatlands have been converted since 2010 will satisfy the Climate Bonds Standard Forestry Criteria for this requirement</p>
Soil health – a soil management plan is developed and implemented with a focus on soil carbon, productivity, retention of soil, retention of soil biomass and soil structure	<p>PEFC International Standard, 5.1.1: 'Forest management planning shall aim to maintain or increase forests and other wooded areas and enhance the quality of the economic, ecological, cultural and social values of forest resources, including soil and water.'</p> <p>5.1.9: 'Forest management practices shall safeguard the quantity and quality of the forest resources in the medium and long term by... preferring techniques that minimise direct or indirect damage to forest, soil or water resources.'</p> <p>5.2.7: 'Appropriate forest management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions or the use of tending, harvesting and transport techniques that minimise tree and/or soil damages shall be applied'</p> <p>5.3.5: 'Regeneration, tending and harvesting operations shall be carried out in time, and in a way that does not reduce the productive capacity of the site, for example by avoiding damage to... the forest soil, and by using appropriate systems.'</p> <p>5.5.1: 'Forest management planning shall aim to maintain and enhance protective functions of forests for society, such as... protection from soil erosion...'</p> <p>5.5.3: 'Special care shall be given to silvicultural operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Inappropriate techniques such as deep soil tillage and use of unsuitable machinery shall be avoided in such areas. Special measures shall be taken to minimise the pressure of animal populations.'</p> <p>5.5.5: 'Construction of roads, bridges and other infrastructure shall be carried out in a manner that minimises bare soil exposure, avoids the introduction of soil into watercourses...'</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>
Water management – there has been an assessment done of the water requirements of the forests, impacts on and water needs of downstream users (both human and natural) and	<p>PEFC International Standard, 5.1.1: 'Forest management planning shall aim to maintain or increase forests and other wooded areas and enhance the quality of the economic, ecological, cultural and social values of forest resources, including soil and water.'</p> <p>5.1.9: 'Forest management practices shall safeguard the quantity and quality of the forest resources in the medium and long term by... preferring techniques that minimise direct or indirect damage to forest, soil or water resources.'</p> <p>5.5.1: 'Forest management planning shall aim to maintain and enhance protective functions of forests for society, such as... protection of water resources and from adverse impacts of water such as floods or avalanches.'</p>



<p>discharges into watercourses. A water management plan is in place that addresses relevant risks and includes measures to protect ground water and local water bodies</p>	<p>5.5.3: 'Special care shall be given to silvicultural operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Inappropriate techniques such as deep soil tillage and use of unsuitable machinery shall be avoided in such areas. Special measures shall be taken to minimise the pressure of animal populations.'</p> <p>5.5.4: 'Special care shall be given to forest management practices in forest areas with water protection functions to avoid adverse effects on the quality and quantity of water resources. Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices influencing water quality in a harmful way shall be avoided.'</p> <p>5.5.5: 'Construction of roads, bridges and other infrastructure shall be carried out in a manner that... avoids the introduction of soil into watercourses and preserves the natural level and function of water courses and river beds. Proper road drainage facilities shall be installed and maintained.'</p> <p>Summary: PEFC certification is sufficient evidence that this requirement has been met</p>
<p>Fire management – measures have been developed and are implemented for the prevention of destructive forest fires (i.e. fires that do not serve management purposes)</p>	<p>PEFC International Standard, 5.2.2: 'Health and vitality of forests shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as... fire, and damage caused by climatic factors...'</p> <p>5.2.3: 'The monitoring and maintaining of health and vitality of forest ecosystems shall take into consideration the effects of naturally occurring fire...'</p> <p>PEFC International Standard, 5.2.6: 'Lighting of fires shall be avoided and is only permitted if it is necessary for the achievement of the management goals of the forest management unit.'</p> <p>5.7.2: 'Forest management shall provide for adequate protection of the forest from unauthorised activities such as... illegally initiated fires...'</p> <p>Summary: PEFC certification is sufficient evidence that this requirement has been met</p>
<p>Riparian areas protection – provision has been made to protect riparian areas</p>	<p>PEFC International Standard, 5.4.2: 'Forest management planning, inventory and mapping of forest resources shall identify, protect and/or conserve ecologically important forest areas containing significant concentrations of:</p> <ul style="list-style-type: none"> <li>a) protected, rare, sensitive or representative forest ecosystems such as riparian areas and wetland biotopes'</li> </ul> <p>5.5.3: 'Special care shall be given to silvicultural operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Inappropriate techniques such as deep soil tillage and use of unsuitable machinery shall be avoided in such areas. Special measures shall be taken to minimise the pressure of animal populations.'</p> <p>5.5.5: 'Construction of roads, bridges and other infrastructure shall be carried out in a manner that... avoids the introduction of soil into watercourses and preserves the natural level and function of water</p>

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	<p>courses and river beds. Proper road drainage facilities shall be installed and maintained.'</p> <p>5.4.11 Infrastructure shall be planned and constructed in a way that minimises damage to ecosystems, especially to rare, sensitive or representative ecosystems and genetic reserves, and that takes threatened or other key species – in particular their migration patterns – into consideration.</p> <p>5.5.1 Forest management planning shall aim to maintain and enhance protective functions of forests for society, such as protection of infrastructure, protection from soil erosion, protection of water resources and from adverse impacts of water such as floods or avalanches.</p> <p>5.5.4 Special care shall be given to forest management practices in forest areas with water protection functions to avoid adverse effects on the quality and quantity of water resources. Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices influencing water quality in a harmful way shall be avoided.</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>
Biodiversity management – provision has been made for managing and maintaining biodiversity	<p>PEFC International Standard, 5.4.1: 'Forest management planning shall aim to maintain, conserve and enhance biodiversity on ecosystem, species and genetic levels and, where appropriate, diversity at landscape level.'</p> <p>5.4.12: 'With due regard to management objectives, measures shall be taken to balance the pressure of animal populations and grazing on forest regeneration and growth as well as on biodiversity.'</p> <p>5.1.11: 'Conversion of forests to other types of land use, including conversion of primary forests to forest plantations, shall not occur unless in justified circumstances where the conversion:</p> <ul style="list-style-type: none"> <li>a) does not have negative impacts on threatened (including vulnerable, rare or endangered) forest ecosystems, culturally and socially significant areas, important habitats of threatened species or other protected areas...'</li> </ul> <p>5.2.5: 'Forest management practices shall make best use of natural structures and processes... Adequate genetic, species and structural diversity shall be encouraged and/or maintained to enhance the stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.'</p> <p>5.4.2: 'Forest management planning, inventory and mapping of forest resources shall identify, protect and/or conserve ecologically important forest areas containing significant concentrations of:</p> <ul style="list-style-type: none"> <li>a) areas containing endemic species and habitats of threatened species, as defined in recognised reference lists;</li> <li>b) endangered or protected genetic in situ resources; and taking into account</li> <li>c) globally, regionally and nationally significant large landscape areas with natural distribution and abundance of naturally occurring species.'</li> </ul>

	<p>5.4.3: 'Protected and endangered plant and animal species shall not be exploited for commercial purposes. Where necessary, measures shall be taken for their protection and, where relevant, to increase their population.'</p> <p>5.4.8: 'Forest management practices shall, where appropriate, promote a diversity of both horizontal and vertical structures such as uneven-aged stands and the diversity of species such as mixed stands. Where appropriate, the practices shall also aim to maintain and restore landscape diversity.'</p> <p>5.4.10: 'Tending and harvesting operations shall be conducted in a way that does not cause lasting damage to ecosystems. Wherever possible, practical measures shall be taken to improve or maintain biological diversity.'</p> <p>5.4.11: 'Infrastructure shall be planned and constructed in a way that... takes threatened or other key species – in particular their migration patterns – into consideration.'</p> <p>5.4.12: 'With due regard to management objectives, measures shall be taken to balance the pressure of animal populations and grazing... on biodiversity.'</p> <p>5.4.13: 'Standing and fallen dead wood, hollow trees, old groves and special rare tree species shall be left in quantities and distribution necessary to safeguard biological diversity...'</p> <p>5.7.1: 'Forest management shall comply with legislation applicable to forest management issues including... protected and endangered species...'</p> <p>5.1.1 Forest management planning shall aim to maintain or increase forests and other wooded areas and enhance the quality of the economic, ecological, cultural and social values of forest resources, including soil and water. This shall be done by making full use of related services and tools that support land-use planning and nature conservation.</p> <p>5.1.2 Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation, and shall include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimise or avoid negative impacts.</p> <p>5.4.6 Afforestation and reforestation activities that contribute to the improvement and restoration of ecological connectivity shall be promoted.</p> <p>5.4.9 Traditional management systems that have created valuable ecosystems, such as coppice, on appropriate sites shall be supported, when economically feasible.</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>
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<p>Species selection – no introduction of invasive species that may disrupt genetic diversity or that are not suitable for current or projected future ecological conditions</p>	<p>PEFC International Standard, 5.2.5: 'Forest management practices shall make best use of natural structures and processes... Adequate genetic, species and structural diversity shall be encouraged and/or maintained to enhance the stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.'</p> <p>5.4.1: 'Forest management planning shall aim to maintain, conserve and enhance biodiversity on ecosystem, species and genetic levels and, where appropriate, diversity at landscape level.'</p> <p>5.4.2: 'Forest management planning, inventory and mapping of forest resources shall identify, protect and/or conserve ecologically important forest areas containing significant concentrations of:</p> <p style="padding-left: 40px;">c) endangered or protected genetic in situ resources</p> <p>5.4.5: 'For reforestation and afforestation, origins of native species and local provenances that are well-adapted to site conditions shall be preferred, where appropriate. Only those introduced species, provenances or varieties shall be used whose impacts on the ecosystem and on the genetic integrity of native species and local provenances have been evaluated, and if negative impacts can be avoided or minimised.'</p> <p>'Note: CBD (Convention on Biological Diversity) Guiding Principles for the Prevention, Introduction, and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species are recognised as guidance for avoidance of invasive species.'</p> <p>5.4.11: 'Infrastructure shall be planned and constructed in a way that... takes threatened or other key species – in particular their migration patterns – into consideration.'</p> <p>5.2.7 Appropriate forest management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions [...] shall be applied.</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>
<p>Chemical use – prohibition of active ingredients that are listed in the Stockholm Convention, the Rotterdam Convention or that are listed as classification Ia or Ib in the WHO recommended Classification of Pesticides by Hazard, except in case of an emergency</p>	<p>PEFC International Standard, 5.2.12: 'Where fertilisers are used, they shall be applied in a controlled manner and with due consideration for the environment.'</p> <p>5.5.4: '...Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices influencing water quality in a harmful way shall be avoided.'</p> <p>5.2.8: The use of pesticides shall be minimized and appropriate silvicultural alternatives and other biological measures preferred</p> <p>5.2.9: The WHO type 1A and 1B pesticides and other highly toxic pesticides shall be prohibited, except where no other viable alternative is available</p> <p>5.2.10: Pesticides, such as chlorinated hydrocarbons whose derivatives remain biologically active and accumulate in the food chain beyond their intended use, and any pesticides banned by international agreement,</p>

<p>situation or a governmental order. In these cases, environmental and social risk assessment is required</p>	<p>shall be prohibited</p> <p>Note: “pesticides banned by international agreements” are defined in the Stockholm Convention on Persistent Organic Pollutants 2001, as amended</p> <p>5.2.11: The use of pesticides shall follow the instructions given by pesticide producer and be implemented with proper equipment and training</p> <p>5.2.12: Where fertilisers are used, they shall be applied in a controlled manner and with due consideration for the environment</p> <p>5.2.5 Forest management practices shall make best use of natural structures and processes and use preventive biological measures wherever and as far as economically feasible to maintain and enhance the health and vitality of forests. Adequate genetic, species and structural diversity shall be encouraged and/or maintained to enhance the stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>
<p>Forest protection – protection and monitoring measures are in place to prevent and monitor for illegal logging and illegal land conversion.</p>	<p>PEFC International Standard, 5.1.2: ‘Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation...’</p> <p>5.1.7: ‘Monitoring of forest resources and evaluation of their management shall be periodically performed, and results fed back into the planning process.’</p> <p>5.7.2: ‘Forest management shall provide for adequate protection of the forest from unauthorised activities such as illegal logging, illegal land use, illegally initiated fires, and other illegal activities.’</p> <p>5.2.2 Health and vitality of forests shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as pests, diseases, overgrazing and overstocking, fire, and damage caused by climatic factors, air pollutants or by forest management operations.</p> <p>Summary:</p> <p>PEFC certification is sufficient evidence that this requirement has been met</p>

<p>Resilience checklist 1 - Future climate change related risks and vulnerabilities to the asset/site have been evaluated</p>	<p>5.1.2 Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation, and shall include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimise or avoid negative impacts</p> <p>5.2.2 Health and vitality of forests shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as pests, diseases, overgrazing and overstocking, fire, and damage caused by climatic factors, air pollutants or by forest management operations.</p> <p>5.2.4 Forest management plans or their equivalents shall specify ways and means to minimise the risk of degradation of and damages to forest ecosystems. Forest management planning shall make use of those policy instruments set up to support these activities</p> <p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are PEFC certified.</p>
<p>Resilience checklist 2 - A plan has been designed and implemented to mitigate and adapt to the climate risks and vulnerabilities identified and to improve the resilience of the assets</p>	<p>5.1.2 Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation, and shall include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimise or avoid negative impacts</p> <p>5.1.4 Management plans or their equivalents, appropriate to the size and use of the forest area, shall be elaborated and periodically updated. They shall be based on legislation as well as existing land-use plans, and adequately cover the forest resources</p> <p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are PEFC certified.</p>
<p>Resilience checklist 3 - There is a plan in place to periodically re-evaluate the risks climate change poses</p>	<p>5.1.2 Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation, and shall include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimise or avoid negative impacts</p> <p>5.1.4 Management plans or their equivalents, appropriate to the size and use of the forest area, shall be elaborated and periodically updated. They shall be based on legislation as well as existing land-use plans, and adequately cover the forest resources</p> <p>5.1.7 Monitoring of forest resources and evaluation of their management shall be periodically performed, and results fed back into the planning process</p> <p>5.2.2 Health and vitality of forests shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as pests, diseases, overgrazing and overstocking, fire, and damage caused by climatic factors, air pollutants or by forest management operations.</p>



	<p>Summary:</p> <p>Issuers will have to show compliance with the resilience checklist even if they are PEFC certified.</p>
Governance evaluation	
Multi-stakeholder involvement in standard development process	Yes
Scientific input in development of standard	Yes
Transparency in public reports and communication of the standard	Yes
Complaints and appeals process is in place	<p>Complaints against certificate holders:</p> <p>Complaints and appeals relating to the decisions and activities of a certified entity; an accredited certification body or an accreditation body shall be dealt with by the complaints and appeals procedures of the relevant accredited certification body; accreditation body; or by the International Accreditation Forum.</p> <p>Complaints against the performance of the certification scheme as such:</p> <p>Complainants must outline their concern in a letter to PEFC accompanied by supporting documentation. The information provided must be verifiable as accurate and correct. PEFC assigns a Task Force to deal with the complaint or appeal. Members of the Task Force must not have a vested interest in or conflict with the subject matter. PEFC's Board of Directors decides on the complaint or appeal, based on a written report by the Task Force.</p>
Regular reviews and revisions of the standard	Yes
Training of auditors	Yes, see <a href="https://www.pefc.org/certification-services/chain-of-custody-training">https://www.pefc.org/certification-services/chain-of-custody-training</a>
Training opportunities for users of the standard	Yes, see e.g. <a href="http://www.pefc.co.uk/events/save-the-date-pefc-2018-workshop-dates">http://www.pefc.co.uk/events/save-the-date-pefc-2018-workshop-dates</a> for an example from the UK
Audits required	Yes, certification must comply with ISO 17021 or ISO Guide 17065, both of which require annual audits
Sanction mechanisms in place	Yes, certification must comply with ISO 17021 or ISO 17065, both of which require sanction mechanisms

## Appendix 3: Summary of public consultation

No.	Feedback received	Response
1	The Criteria should require issuers to make FSC and PEFC audits publicly available	Will leverage what FSC or PEFC stipulates
2	What if a concession or forest is newly purchased and it's the first time it will be harvested and all is legally done in accordance with the forest law? In this case it is probably an IFL but road construction should be allowed.	Verifiers cannot check that projects are in accordance with all applicable laws. This is beyond the scope of their verification.  Opening the road requirements further is risky so will stick with what is there.  No change proposed
3	Due to the low productivity of the soil many smallholders have a cultivation cycle that includes a longer production pause where a new forest regenerates. This young regeneration and up to low density forest will be burned down after 5 to 10 years. Conversion of this land into a forest plantation would have a net positive impact. This is THE common smallholder agriculture practice in the amazon low- and high- land.	TWG did not suggest altering as it would mean changing the natural land conversion requirement and risk allowing through projects that are converting established natural forests.  Here, the Criteria take a strict stance to make sure there is not the possibility of Certifying projects that are contributing to deforestation.
4	What happens to the certification in case of fire or natural disasters? For example, if there is a proposed review process, this may take many years: what will happen with certification in the meantime? How will it be ensured that this does not create a loophole for destructive practices?	FSC and PEFC require that in the event of a natural disaster measures are put in place to return the habitat back to what was there before.  The Forestry Criteria will leverage FSC and PEFC's mechanism and if those certifications are withdrawn following a natural disaster, Climate Bonds Certification will also be withdrawn.

No.	Feedback received	Response
5	<p>There is no mechanism to ensure human rights are protected and no requirement that ensures Free, Prior and Informed Consent (FPIC) is carried out.</p> <p>Particularly concerned about this in relation to conservation and restoration projects.</p> <p>Recommend that parties seeking to meet the Forestry Criteria obtain certification from existing certification schemes, such as the Climate, Community and Biodiversity standards and that it require all projects seeking to meet the CBI Forestry Criteria to fully apply the High Carbon Stock Approach and High Conservation Values.</p>	<p>A requirement around Free, Prior and Informed Consent (FPIC) has been added to the Forestry Criteria.</p>
6	<p>There are no criteria to determine if there has been a net positive effect on surrounding communities.</p>	<p>Net positive effects on forest communities will remain outside of scope for these criteria.</p> <p>We will be clear in all documentation about the scope of the Criteria and make sure it could not be construed that we are certifying that net positive effects on social aspects are being checked.</p>
7	<p>High Carbon Stock Approach should always be used in association with High Conservation Value assessments. The two organisations have developed a manual for joint assessment, and assessments of HCVs is a requirement for companies wishing to use the HCSA approach.</p> <p>The HCS methodology is intended to be applicable for any moist tropical forest on mineral soils, but the HCS Approach Toolkit Module 4 includes details of variations to the methodology which might be necessary to address issues relating to image quality and types of land cover and land use in different regions.</p>	<p>The Criteria have been edited to recognise that these schemes have been combined.</p>

No.	Feedback received	Response
8	Question about whether the Criteria should require an increase in carbon stocks at best and maintenance of carbon stocks at minimum	Certification is not awarded in levels, it is a pass or fail. This makes it difficult to specify what is the minimum and what is best.  No change.
9	Will emissions from harvesting, transportation, processing and disposal be considered? Does assessment involve the entire life cycle of emissions?	In some areas of the supply chain there must be some level of renewable energy used in facilities. Will make sure this is explained clearly.
10	We recommend additional requirements to facilitate additionality from plantation assets and to reduce their negative impact risk.	Additionality is not something that can be easily measured with green bonds and we do not require additionality in any sectors.  No change.
11	It is a concern that the criteria permit the logging of primary forests - we favour a clear exclusion instead.	We explain in the background document why logging of primary forest can in some cases be Certifiable. This was a decision that the TWG and IWG supported  No change.
12	Suggest adding a request for disclosure on monoculture, species used, alien species and GM plants, disclosure on plantation type/composition and percentage of unconverted/conservation land.  This should hold for supply chain as well as forestry assets. Supply chain assets should be required to disclose their operational safeguards	We will add some text about best practice disclosure. We cannot require this level of disclosure for Certification.
13	It is not clear what the minimum requirements an external standard, such as FSC or PEFC, must meet in order to be leveraged by the Forestry Criteria	We have edited the background document to explain clearly the minimum performance we expect an external standard to meet for it to be leveraged in the Forestry Criteria.
14	Disagree that FSC and PEFC are equally valid Standards.	The opinion we are giving is not that both schemes are equally robust or strict, but rather that both were found to meet the minimum requirements for the purpose of the Forestry Criteria.

No.	Feedback received	Response
15	PEFC should not be leveraged by the Forestry Criteria on the basis of being weak on FPIC and because Greenpeace recommends FSC as the best certification scheme and advises against using PEFC	We are proposing to continue to leverage PEFC as it meets the requirements of the Forestry Criteria sufficiently.  No change.
16	Is it national or international FSC or PEFC certification that is being requested?	Any FSC or PEFC certification is accepted (i.e. international or national)
17	What happens to CBI certification if FSC certification is allowed to lapse during the lifetime of the bond?	Climate Bonds Certification would be revoked
18	What happens to CBI certification if a change in circumstances prevents re-certification of forest asset? FSC may, in first instance, issue Corrective Action Requests (CARs) – what would be the status of CBI certification in this phase?	Certification would be revoked if the CARs are not corrected. We would have to put the bond on a watch list while it is in this phase
19	Issuers need to disclose any pending and past requests as well as any remedial action that has been taken. The same applies to any PEFC audit findings.	Agree, should add this request
20	Issuers should disclose certification, including expiry dates, for all of their forest holdings, not just the holdings funded by a given bond, as well as any certification in progress or that has been revoked.	Agree in part, I don't think we can ask them to disclose about projects that are outside of the bond
21	In the absence of in-field verification, third party verification needs to be strengthened.	We don't have the ability to require in-field verification. By leveraging FSC and PEFC certification in many places we ensure that further verification has been done on projects.  The green bond market accepts the model we run of third-party verification and this is the business model that the verifiers work from.  No change.

No.	Feedback received	Response
22	There is no additional verification from Climate Bonds Initiative. This means that the strength of the standard rests on an assumption that the basic FSC model is solid, and an assumption of compliance verified by an auditor chosen by the client.	Misunderstood the Criteria. There is additional verification, other than FSC/PEFC certification, based on the resilience checklist. Verifiers will check compliance with FSC/PEFC, compliance with the resilience checklist and, in some cases, compliance with the management plan.  No change.
23	Is there a set of checks to ensure the third-party verifiers are not too close to the client?	Yes, verifiers are required by the Climate Bonds Standard to notify of any conflict of interest, which includes being too close to the client
24	Is there a third-party verification process to check the auditing process?	Third party verification is the model we run. This will check compliance with FSC/PEFC and all other aspects of the Criteria that are relevant
25	Will activities be verified by third parties to ensure reported results are correct?	Yes, at pre-issuance and post-issuance
26	How will the robustness of reporting mechanisms on activities supported by bond financing be guaranteed?	Annual reporting is required. Climate Bonds checks it, if there is any doubt of compliance we can request a official verification of annual reporting
27	Use of 'social' in the background document	Delete 'social' it is misleading in terms of our scope
28	Management plan includes chemical use and biodiversity management, i.e. beyond the scope of climate	Rationale for including biodiversity is that this maintains a healthy ecosystem which affects the carbon sequestration and resilience of the forest. Equally use of damaging chemicals can in the long term affect the ability of the land to foster growth, therefore limiting its ability to sequester carbon.
29	How is the resilience checklist verified?	External verifier is responsible for giving an opinion about whether the checklist has been met
30	Scope of the resilience checklist	The resilience checklist looks at the functionality of the assets or the ability for the assets to achieve their objectives – i.e. operational resilience (not the resilience of the surrounding systems).
31	Clarify that palm oil is not covered	Palm oil will be tackled in the Agriculture Criteria



No.	Feedback received	Response
32	Solid, objective justification is needed to show that climate bonds will be an effective method for reducing GHG emissions	Expanded explanation of how the mitigation requirements ensure good GHG emission performance
33	A method is needed for standardising forest and land-use definitions	Where possible we refer to FAO definitions. If terms are not defined by FAO then we refer to another relevant and robust external definition.
34	Can you explain the peer review process of resilience?	TWG, IWG and then public consultation
35	The definitions of forestry are highly variable, so that 'natural forest' and 'forested land' mean different things to different people.	Reviewed definitions and consistency within the document
36	Criteria wording on roads is confusing	Reviewed for clarity
37	Unclear how conservation and restoration of non-forested land fits within Forestry Criteria.	Reviewed and expanded justification for this

## Appendix 4: References

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For further reference

#### General references

- Climate Bonds Standard: <http://www.climatebonds.net/standards/standard>
- IPCC: <http://www.ipcc.ch>
- IPCC Emissions Factor Database: <http://www.ipcc-nggip.iges.or.jp/EFDB/main.php>
- FAO STAT: <http://faostat3.fao.org/home/E>
- Green Growth Knowledge Platform: <http://www.greengrowthknowledge.org>

#### National references

- National Communications to the UNFCCC: [http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/items/2979.php](http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php) and [http://unfccc.int/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/items/3625.php](http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/3625.php)
- Submitted National Adaptation Programme of Actions (NAPA): [http://unfccc.int/adaptation/knowledge\\_resources/ldc\\_portal/items/4722.php](http://unfccc.int/adaptation/knowledge_resources/ldc_portal/items/4722.php)
- Submitted Nationally Appropriate Mitigation Actions (NAMAs): <http://www4.unfccc.int/sites/nama/SitePages/Home.aspx>
- Global Climate Change Alliance national programs: <http://www.gcca.eu>

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#### Mitigation references

- UNFCCC CDM Methodologies: <https://cdm.unfccc.int/methodologies/index.html>
- UNFCCC JI Methodologies: [http://unfccc.int/kyoto\\_protocol/mechanisms/joint\\_implementation/items/1674.php](http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php)
- Verified Carbon Standard: <http://www.v-c-s.org>
- American Carbon Registry: <http://americancarbonregistry.org>
- Gold Standard: <http://www.goldstandard.org/luf>
- European Commission monitoring and reporting of GHG emissions: [http://ec.europa.eu/clima/policies/g-gas/monitoring/index\\_en.htm](http://ec.europa.eu/clima/policies/g-gas/monitoring/index_en.htm)

#### Adaptation references

- European Climate Adaptation Platform: <http://climate-adapt.eea.europa.eu/agriculture-and-forestry>
- US EPA Climate Change Impacts and Adapting to Change: <http://www.epa.gov/climatechange/impacts-adaptation/>
- Climate Adaptation Knowledge Exchange (CAKE): <http://www.cakex.org>
- ADAPT Asia-Pacific: <http://www.adaptasiapacific.org>
- Asia Pacific Adaptation Network: <http://www.apan-gan.net>
- Global Adaptation Network: <http://www.ganadapt.org>

#### Forestry best practice standards

- ITC Standards Map: <http://www.standardsmap.org>
- ISEAL Alliance: <http://www.isealliance.org/our-sectors>
- GIIN IRIS (impact reporting metrics): <https://iris.thegiin.org>
- Climate and Community & Biodiversity Alliance: <http://www.climate-standards.org>
- Forest Stewardship Council (FSC): <https://us.fsc.org>
- American Tree Farm System: <https://www.treefarmssystem.org>
- Canadian Standards Association: <http://www.csasfmforests.ca>
- Programme for the Endorsement of Forest Certification: <http://www.pefc.org>
- Sustainable Forestry Initiative: <http://www.sfiprogram.org>
- IRFS (IAS41): <http://www.iasplus.com/en/standards/ias/ias41>
- USPAP: <http://www.uspap.org>
- AASB: <http://www.aasb.gov.au>
- SASB: <http://www.sasb.org/standards/status-standards/>
- TEEB: <http://www.teebweb.org>