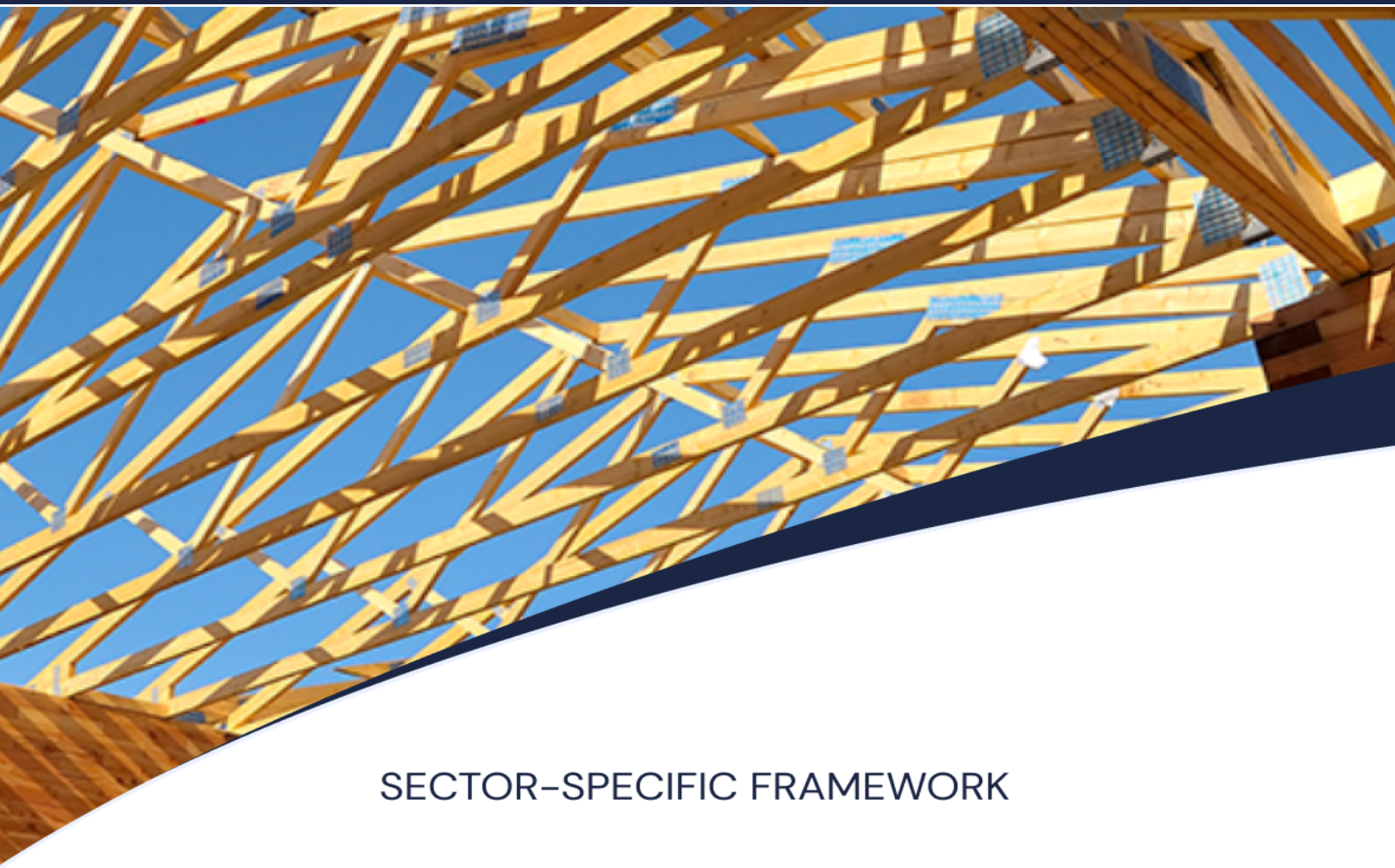

SECTOR-SPECIFIC FRAMEWORK

Biobased construction materials

Organization	Riverse SAS
Version	V1.1
Date	Oct 23, 2023

riverse.

Glossary

Biobased: materials derived from renewable biomass sources, such as plants, that can be used in construction and other applications

Biogenic CO2: carbon dioxide (CO2) released into the atmosphere from the combustion or decay of biobased materials. It is considered part of the short, natural carbon cycle. As opposed to fossil based CO2.

Carbon negative: a process or material that removes more carbon from the atmosphere than it emits, resulting in a net reduction in atmospheric CO2.

Carbon neutral: a process or material whose emissions and removal of CO2 from the atmosphere balance out, resulting in no net increase in atmospheric CO2.

Carbon removal: actions or technologies that capture and store CO2 from the atmosphere, reducing greenhouse gas levels.

Environmental Product Declaration (EPD): a standardized and independently verified document that communicates the environmental performance of a product, including construction materials, based on a life cycle assessment.

Reference service lifetime: the expected or predefined period of use for a product or construction material, used as a basis for assessing its environmental impact over its life cycle.

Modules A-D: components and terminology of an environmental assessment under EN 15804, outlining the stages of a life cycle assessment for construction materials. They encompass (A) Production, (B) Construction/Installation, (C) Use, and (D) End of Life

Introduction

Buildings are responsible for 21% of global greenhouse gas emissions (GHGs)[1]. These can be split into operational emissions (mostly energy consumption while buildings are used), and **embodied emissions** (emissions from the production, maintenance, and waste treatment of building materials). Embodied emissions of buildings account for almost 5-12% of national GHGs across European countries[2]. Much of this impact comes from the energy-intensive production of cement and steel, which are the top two building materials used globally, along with masonry (bricks, blocks, and stone)[3].

Biobased construction materials have lower embodied GHG emissions than these conventional materials because they 1) are mostly composed of carbon-neutral or carbon-negative biogenic carbon and 2) can have less energy-intensive manufacturing processes.

If the product has an expected lifetime of 100 years or more, then the biogenic content of that product can count towards carbon removal credits. If the lifetime is less than 100 years, then the benefit of biobased materials will still be counted in avoidance credits, where the project material has lower impacts than conventional materials thanks to its carbon-neutral inputs.

Technology description

Biobased construction materials are manufactured from organic, renewable sources such as plants, trees, and agricultural byproducts. They offer a unique advantage by taking up carbon during their growth, thereby reducing greenhouse gas emissions. Using such materials in construction products takes advantage of carbon-neutral or carbon-negative building materials.

Biomass used in biobased construction materials include wood (timber/lumber), bamboo, hemp, straw, recycled paper, and flax, among others.

[1] Cabeza, L. F., Q. Bai, P. Bertoldi, J.M. Kihila, A.F.P. Lucena, É. Mata, S. Mirasgedis, A. Novikova, Y. Saheb, 2022: Buildings. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. doi: 10.1017/9781009157926.011

[2] European Commission, Buildings and construction. Accessed October 2023

[3] Cabeza, L.F., Boquera, L., Chàfer, M., Vérez, D., 2021. Embodied energy and embodied carbon of structural building materials: Worldwide progress and barriers through literature map analysis. Energy and Buildings 231, 110612. https://doi.org/10.1016/j.enbuild.2020.110612

These can be incorporated into various building materials. These range from traditional materials such as wood (whose use varies widely depending on region), to innovative materials such as mycelium insulation and cellulose nanocrystals[4], to any materials containing some percent of biomass.

Common products include wood framing, wood panels, hempcrete (concrete containing hemp fibers), and thermal insulation (made from many different materials).

European context

Few official figures exist, but it is clear that biobased construction is not the norm, and would benefit from carbon credits to scale up. For example, in France an estimated 10% of residences are built with wood[5], and 7% of wall insulation renovations were done with biobased materials[6]. In the Netherlands, only 2% of construction is wood-based, and 0.1% of construction uses other biobased materials[7].

There are clear regional preferences for the types of building material used, based on material availability, traditional architecture style, technical know-how, and local climate. For example, in Germany and Belgium walls are mostly constructed with clay blocks. These are rarely used in the Netherlands or the UK, where instead calcium silica and concrete are mostly used[8]. Use of timber in construction varies widely across European countries, with countries like Spain and Cyprus using the least, and Norway and Estonia using among the most[9].

Project Eligibility

The Riverse Standard Rules defines 14 eligibility criteria, detailed below as they relate to biogas projects. Projects must justify that they meet each criteria by providing responses to questions, operations data, and proof.

[4] Chavance, Y., Filleux, S.-L., 2023. Building tomorrow: 9 biobased materials. INRAE- Bioeconomy.

[5]Chavance, Y., Filleux, S.-L., 2023. Building tomorrow: 9 biobased materials. INRAE- Bioeconomy.

[6] Thibaut Lecompte, Vincent Picandet, 2022. Bio-based materials improve the comfort and carbon footprint of buildings. Polytechnique Insights.

[7] Wageningen University & Research, 2022. Environmental performance of biobased building materials

[8] McKinsey & Company, 2019. Value creation in European building materials—where do the opportunities lie?

[9] Sikkema, R., Styles, D., Jonsson, R., Tobin, B., Byrne, K.A., 2023. A market inventory of construction wood for residential building in Europe – in the light of the Green Deal and new circular economy ambitions. Sustainable Cities and Society 90, 104370. https://doi.org/10.1016/j.scs.2022.104370

C1 - Measurability

Projects must prove that they avoid GHG emissions based on a **comparative life cycle assessment** (LCA). The LCA for the project and baseline scenario should be in the format of an Environmental Product Declaration (EPD) or similar. For removal credits the LCA must explicitly show the biogenic carbon.

EPDs are compliant with the following international standards/norms:

- EN 15804
- ISO 21930
- ISO 14025
- ISO/TS 14027
- ISO 14040
- ISO 14044

The LCA should follow the method described in the Life Cycle Assessment section below.

C2 - Real

Projects must prove that they:

- exist and operate as claimed, or
- are being developed and will soon begin operations.

This can be proven by contracts, bills, or quotes from sales of the project's product. This is also proven through a site validation audit once the project has been certified.

For **pre-financing** of projects, proof may include contracts or receipts from the purchase of key machinery, signed agreements with buyers/suppliers, loan documents, or other proof of intent to launch the described project.

C3 - Additionality

All projects must demonstrate their Regulatory Additionality, plus either financial or prevalence additionality.

Regulatory additionality

Projects must prove that **their activities are not already mandated** by regulation, even if there are relevant regulations that cover the project type. This is to ensure that the project would not have been implemented regardless of issuance of carbon credits. The Riverse team provides this analysis at a high regulatory level, but projects must ensure that there are no local regulations that mandate their activities.

Several regulations relate to or promote biobased construction, but none mandate it. The European Union's (EU) Energy Performance of Buildings Directive (EPBD) and the Circular Economy Action Plan promotes the use of biobased materials.

The French RE2020 (Réglementation Environnementale 2020) covers sustainable building practices, but does not specifically address biobased construction. The French Article L228-4 of the Environmental Code states that biobased or low-carbon materials must be used in at least 25% of heavy renovations and new construction *from the public sector*, starting in 2030[10].

Financial additionality

Higher material costs is a widely recognized barrier to biobased construction[11]. Projects must prove that they are in financial need, and that revenue from carbon credits would not go towards enriching project developers. Biobased construction projects may prove that they:

- are operating at a financial loss and need additional funding
    - Proof: **audited accounting documents showing negative financial results,** such as negative cash flow, high amount of and reliance on debt, increasing working capital requirements
- are operating and seeking funding to improve their technology
    - Proof: **a business plan of improvements, justifications, estimated cost, timeline, and description of why it cannot be funded by other sources**
- are operating and their product is more expensive than the conventional options, and will use funding from carbon credits to decrease the selling price

[10] Code de l'environnement : Section 4 : Performance environnementale de la commande publique (Articles L228-4 à L228-5)
[11] Dams, B., Maskell, D., Shea, A., Allen, S., Cascione, V., Walker, P., 2023. Upscaling bio-based construction: challenges and opportunities. Building Research & Information 51, 764–782. https://doi.org/10.1080/09613218.2023.2204414

    - Proof: **financial analysis comparing market prices of project and baseline construction materials, with and without price subsidies from carbon credits**

- are raising funds to develop a new site
    - Proof: **business plan showing dependence on funding from the sale of carbon credits**

Prevalence additionality

The project may **prove that it is currently far from becoming norm/ market practice.**

If using prevalence additionality, projects must prove that funding from carbon credits will go towards subsidizing or improving the technology to increase its adoption. Funding can not enrich the project.

C4 - Permanence

Permanence is a particularly important criteria for removal credits issued from biobased construction. Biobased materials with an expected service **lifetime of 100 years or more** are eligible for **carbon removal credits**. Expected service lifetimes are provided by project developers, and are typically displayed in Environmental Product Declarations (EPDs).

For composite materials made of multiple components with different lifetimes, the **lifetime of the final product will be used**, even if some components have technically longer lifetimes. Projects may petition to exceptionally consider a longer lifetime for one component if they can prove that the component will be reused or recycled.

All biobased construction materials are eligible for avoidance credits, which are not subject to permanence criteria and do not have a threshold lifetime duration.

Projects must follow the risk assessment framework outlined in the Permanence section of the Riverse Standard Rules. Five risk categories are evaluated: Social, Economic, Environmental, Technical and Administration. Full details can be found in the Standard Rules.

Risk factors category	Risks to consider
Social	• Land tenure and/or rights to climate benefits are disputed • Political or social instability • Community support for the project is not maintained

Economic	• Insufficient finance to complete project activities • External parties carry out activities that reverse climate benefits
Environmental	• Fire • Extreme weather or geological events
Technical	• Project activities fail to deliver expected climate benefits • Technical capacity to implement project activities is not maintained • Maintenance of reservoirs • Leakage/burden shifting
Administrative	• Capacity of the project coordinator to support the project is not maintained

C5 - Unicity

Carbon credits must only be counted once. They must not be

1) double counted by being issued in multiple registries

- Proof: **signed agreement between Riverse and the Project Developer including a unicity clause**.

2) claimed by both the project and upstream suppliers of the biomass inputs

- Proof: **signed letter from suppliers (representing >20% of supply) attesting their materials have not already been issued carbon credits**

3) claimed by both the project and downstream buyers/users of the product

- Proof: **marketing communication/disclaimer clearly stating that carbon credits have already been issued for the product and are managed in the Riverse registry,** and that users of the project may not 1) issue carbon credits or 2) brand the product as carbon negative or storing carbon

C6 - Co-benefits

According to the Riverse Standard Rules, projects must provide at least 2 co-benefits from the UN Sustainable Development Goals (SDGs) framework. Common co-benefits of biobased construction materials, and their sources of proof, are detailed in Table 1.

Projects are welcome to submit information to prove that they provide other co-benefits not mentioned here.

UN SDG	Example	Proof
7.3 Double the global rate of improvement in energy efficiency	Biobased construction may have improved energy efficiency	Results from material performance testing
8.4 Resource efficiency in consumption and production	Projects using waste biomass instead of raw materials such as concrete and steel use less raw resources	Records of biomass inputs showing waste products (i.e. straw, recycled paper…)
9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes	Biobased construction may have a longer service lifetime or other performance improvements in the use phase (i.e. which are not accounted for in the scope of the life cycle assessment)	Results from material performance testing
12.2 Achieve the sustainable management and efficient use of natural resources	If waste biomass is used, projects give value and a second usable life to that waste	Records of biomass inputs showing waste products (i.e. straw, recycled paper…)

15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services	Projects using wood from sustainably managed forests support the continued management of those forests	Records of wood inputs from forests that receive a sustainability certificate

Table 1 Common co-benefits that biogas projects may provide are detailed, including types of proof that can be used to justify each co-benefit.

C7 - Substitution

Projects must prove that their final product is a valid substitute for the product they claim to replace. This must account for the function of the product, price/quality level, and environmental conditions under which it is used.

For biobased construction, this means specifically that **the performance and the service lifetime must be comparable to the product it replaces.** Relevant indicators for performance vary depending on the type of biobased product, but may include energy efficiency, strength, mechanical resistance, reaction to fire, or insulation capacity.

If the service lifetimes differ between the baseline and the project, the difference will be accounted for in the comparative LCA.

A main criteria in choosing a baseline scenario is similar performance characteristics, but all relevant characteristics are rarely identical for the two materials. If the performance of the project scenario material is worse than the baseline, then additional credits (removal or avoidance) will be added to the provision pool, proportionally to the level of worse performance starting at 5%.

- For example, if an insulation material has 10% lower thermal performance in the project than in the most similar, reasonable baseline material, then an additional 10% of the project's credits will be added to the buffer.

This criteria can be proven through performance tests, dynamic thermal studies and EPDs.

C8 - Environmental & social do no harm

Projects must prove that they do not contribute to substantial environmental and social harms. Table 2 below presents the main environmental and social risks to be considered for biobased construction materials projects. The project or the Riverse team may suggest additional risks to be considered for a specific project.

Project developers must describe how the project manages each identified problem in Table 2. Based on this information, the Riverse team will assign a likelihood to each problem, and couple this information with the risk severity to complete the risk assessment matrix in the DPD. **Problems with high or very high risk levels may require proof from the project developer**. Full instructions are described in the Riverse Standard Rules.

The first risk in Table 2 on forest management is particularly important for projects using large amounts of wood and timber. Projects must provide information about any sustainable forest management certificates their suppliers have, such as Programme for the Endorsement of Forest Certification (PEFC), Forest Stewardship Council (FSC), Nordic Swan Ecolabel (in Nordic countries) or Forest & Trade Label (FSC) in France.

Note that thanks to the life cycle assessment approach, the climate impacts of all environmental risks are automatically accounted for in the calculation of projects' GHG emissions and carbon credits.

Problem	Impact	Severity
Forest management, land use and deforestation	Biodiversity, land use change, local environmental pollution	Major
Intensive cultivation of biomass with fertilizers, irrigation and pesticides	Biodiversity, environmental pollution, human toxicity, water depletion	Major
Use of dedicated crops, competition for food and agricultural land	Land use change	Major
Distant transport of biomass	GHG emissions and climate change impact	Moderate
Chemical treatment	Human toxicity, environmental	Moderate

	pollution	
Energy intensive processing	GHG emissions and fossil fuel depletion	Moderate

Table 2 Environmental and social risks that are especially relevant for biobased construction material projects are presented. Severity is determined qualitatively at the sector level. It is based on the duration, permanence, cumulative and cascading impacts, and expected magnitude of each impact. Severity levels include negligible, minor, moderate, major, and catastrophic.

C9 - Leakage

The **project's avoided GHG emissions should not be indirectly transferred elsewhere.**

There is a risk that if the conventional construction materials displaced by biobased construction materials are sold and used elsewhere, the net emissions reduction thanks to the project may be offset by increased emissions in those other locations. This risk is valid and is outside the scope of Riverse's and projects' intervention.

There is a risk that biomass inputs (forestry or agricultural) may be cultivated in distant areas and imported to the project site. In this sense, impacts from cultivating biomass are shifted to other locations. This risk is managed because transport of feedstock inputs to the project site is included in the LCA to calculate carbon credits.

C10 - Rebound effects

Rebound effects are assessed at the sector-scale by the Riverse team. The risk here is that efficiency and sustainability improvements from biobased construction materials (compared to conventional construction materials) leads to an increase in overall building material consumption, thereby offsetting some of the initial savings. This may occur due to, for example:

- reduced environmental impacts and improved perception of biobased construction materials lead to increased, faster renewal of buildings, before their usable lifetime ends

C11 - Technology Readiness Level

Projects must prove that they have a Technology Readiness Level (TRL) of 6 or higher, meaning that the technology has been demonstrated in a relevant environment.

For biobased construction material projects that are already operating, this may be proved using sales receipts or contracts with clients, to show that they have a TRL 9 (actual system proven in operational environment).

For typical projects under development, this may be proved as above during the verification phase, along with examples of the technology being successfully used elsewhere.

For innovative projects under development, this can be proven using results or files from earlier research stages or prototypes.

C12 - Targets alignment

As construction and housing sector projects, biobased construction materials projects must prove that they lead to at least a 45% reduction in GHG emissions compared to the baseline scenario.

This is proven using a comparative life cycle assessment.

C13 - Minimum impact

Projects must justify at least 1000 tCO2eq avoided or removed over the 5-year crediting period.

This is proven using a comparative life cycle assessment.

C14 - Independently validated

Project's LCA, Detailed Project Description (DPD) and Monitoring Plan files must be audited by a third-party auditor.

Life cycle assessment

A comparative life cycle assessment (LCA) is done to evaluate whether the project activity avoids GHG emissions compared to the baseline, business-as-usual scenario, and how much GHGs are avoided. This LCA also identifies how much carbon is sequestered in the biobased materials and counts towards carbon removal credits, if relevant for the project.

The following sections describe the general approach for the comparative LCA, but do not detail the steps and calculations, since these are covered by the Environmental Product Declaration (EPD) methodology (see Data source section below). LCAs for the project and baseline scenario must come from EPD studies or similar.

Functional unit

The functional unit must include the **amount, units, lifetime, and where relevant, function and properties** of the building material for the project and baseline scenario. The functional unit is the same between the project and baseline scenario. Some functional units for biobased construction materials may include:

- 1 m2 of flooring over 50 years
- 1 tonne of concrete to be used in load bearing walls over 50 years
- 1 m2 of insulation with an R value of 3 K · m2/W for 20 years

Avoided emissions and/or removals are calculated per functional unit, using data from EPDs or similar studies. Annual avoided emissions and/or removals are calculated by multiplying the avoided emissions and/or removals per functional unit by the quantity of building materials produced over the year.

Baseline scenario

A **baseline scenario** in a comparative LCA represents the conditions or practices that would occur in the absence of the project, allowing for a comparison of environmental performance between different options. In this framework, the baseline scenario of biobased construction material is the reference construction material that the project avoids.

According to the Riverse Standard Rules, the baseline construction material should be the specific material replaced by the project or the market average, and in uncertainty a conservative choice should be made. The choice of replacement material should consider:

- functional equivalence
- expected lifespan
- performance characteristics (energy efficiency, strength, mechanical resistance, reaction to fire, or insulation capacity…)

If the lifespan of the baseline and project material differ, the LCA calculations will be adjusted to correct this. If other performance characteristics are not identical and are worse in the project than the baseline, then additional credits will be added to the provision pool (see description in C7 - Substitution).

Data source

Environmental Product Declarations (EPDs) are used as the main source of environmental information for both the project and baseline scenarios. EPDs are standardized and independently verified documents that communicate information about the environmental performance of a product. Their format and methods are dictated by various norms, with the most recent and direct one being European standard EN 15804:2012+A2:2019.

Information taken from EPDs include the product's:

- lifetime
- performance characteristics
- end of life waste treatment methods
- life cycle environmental impacts
- biogenic carbon content

Specifically, within the life cycle environmental impacts category, the total climate change impact is used (sum of fossil, biogenic, and - land use and land use change).

If no EPD is available for a project, then a similar document may be used instead, given that it includes the above information, is independently verified, and follows ISO 14025.

System boundary

The comparative LCA includes the cradle-to-grave impacts of the project and baseline building material. According to the terminology in EN 15804, this is a "cradle to grave and module D" scope that includes all stages of modules A, B, C and D (Figure 1).

Since the inclusion of module D in EPDs was optional up until recently, it may not be available for all project and baseline scenarios. If it is not available for one or both scenarios, then its impacts may be omitted, ensuring comparability between the two scenarios.

Note that only the life cycle of the **building material** is included in this system boundary, and not the life cycle of the building that it is used in. This means that, for example, for an insulation material the sub-module B6-Operational energy would **not** include the heating and cooling energy of the building. This sub-module instead refers to energy use during the operational lifetime of the material/product, such as for a heating system or an elevator.

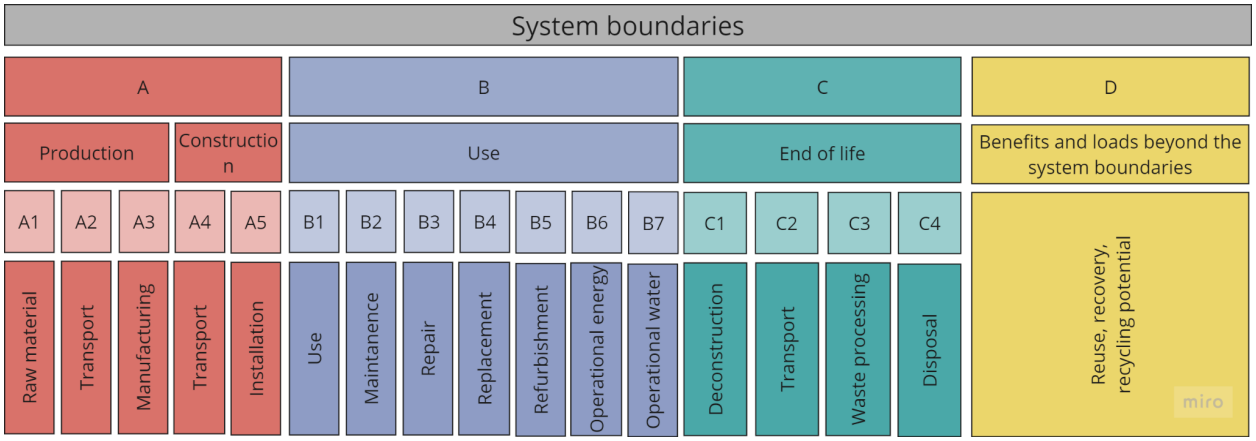

Figure 1 The life cycle stages of a building material are presented, according to the norm EN 15804's terminology using modules A-D.

For avoidance credits, the benefit of biobased construction usually appears in the module A- Production. EPDs treat biogenic carbon with the -1/+1 approach[12], where carbon is taken up in module A- Production and re-emitted in module C- End of life. As a result, the product is carbon neutral. This usually means that production impacts are relatively low, because instead of energy and material intensive production of input materials, production includes rather simple harvest and processing of biomass.

Biogenic carbon and carbon removal

Biobased construction materials with an expected lifetime of 100 years or longer are eligible for carbon removal credits. The **biogenic carbon amount reported in the EPD is the basis for calculating the amount of carbon removal credits** to issue. The kilograms of carbon

[12] Andersen, C.E., Rasmussen, F.N., Habert, G., Birgisdóttir, H., 2021. Embodied GHG Emissions of Wooden Buildings—Challenges of Biogenic Carbon Accounting in Current LCA Methods. Frontiers in Built Environment 7.

stored in the material is converted to kilograms of carbon dioxide equivalents by multiplying by 3.67 (molecular mass of CO2 of 44.01 g/mol divided by mass of C of 12.011 g/mol).

According to EN 15804, biogenic carbon is calculated using the method defined in EN 16449, Wood and wood-based products — Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.

Biogenic carbon uptake is already accounted for in EPDs using the -1/+1 method, as described above. To calculate carbon removal credits, **we must avoid double-counting** the carbon uptake, which is already counted in module A- Production. This **carbon uptake is effectively transferred out of the module A- Production and into a new Removal module** (Figure 2). The total flows of carbon and climate change impacts remain unchanged– only the carbon uptake has been taken out of the life cycle and placed in its own module, and the module A- Production impacts have increased since their carbon uptake benefit was transferred elsewhere.

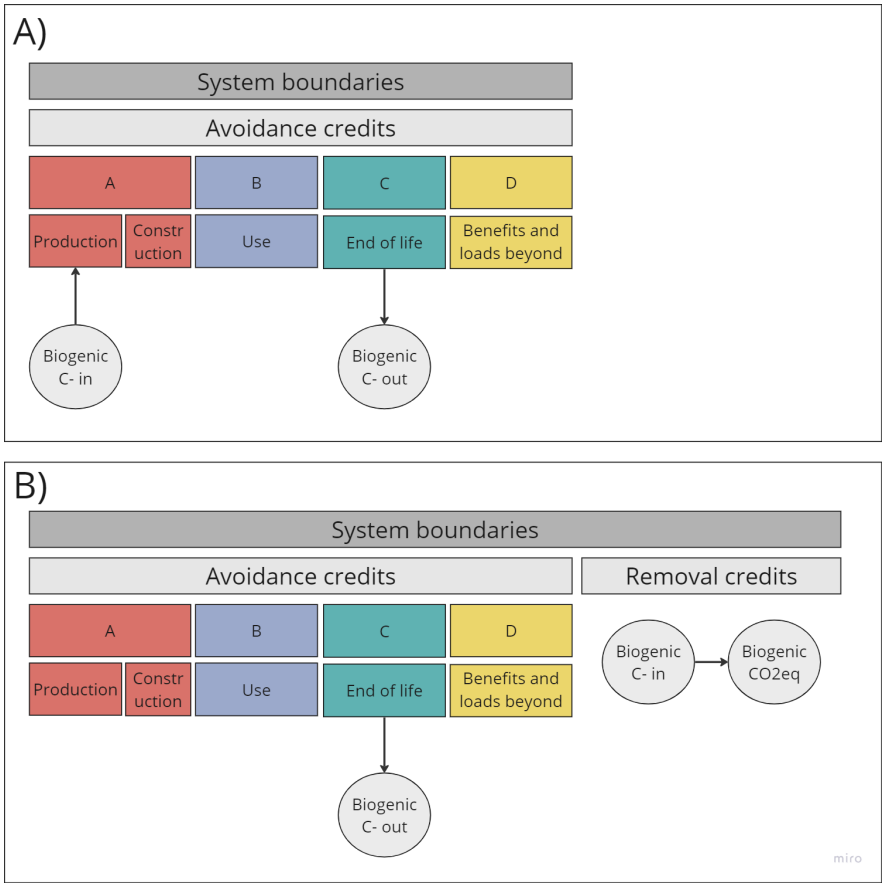

Figure 2 The approach taken by Riverse to manage biogenic carbon for avoidance credits vs removal credits is shown. A) calculation approach when the lifetime is less than 100

years and only avoidance credits are issued, B) approach when the lifetime is 100 years or more and carbon removal credits and avoidance credits are issued.

To determine if a product meets the 100-year lifetime threshold, the Reference Service Lifetime (RSL) is taken from the EPD. If the RSL is greater than or equal to 100 years, then all biogenic carbon in that product is considered for carbon removal credits.

If the RSL is less than 100 years, then there are some exceptions where the product may still be eligible for carbon removal credits:

- if the project developer can demonstrate that the product will be recycled or reused after its first lifetime, and the total years it is used will add up to at least 100
- if the product is a composite made of several materials, and one or more of those materials is biobased, and the product can be dismantled, and the biobased material can be reused or recycled as described above

Questions for project developers

The following table presents the full list of questions that are sent to project developers in order to complete the certification process. They are assigned different priority levels (High, Medium and Low) to indicate which ones may be assumptions rather than real data with proof, or which ones don't require a response and Riverse can fill in with average data. Note that several questions are used for both calculating the LCA and determining the project eligibility.

Purpose	Question
LCA	Please provide the Environmental Product Declaration (EPD), Fiches de Déclaration Environnementale et Sanitaire (FDES), or other similar LCA for your product
	What is the product lifetime?
	Is there a specific baseline material that you would like to propose, that your product likely replaces? If so, please provide its name, link to EPD or FDES, and describe why it is an appropriate baseline. If not, we will choose a baseline.

	Does your EPD/FDES/LCA include module D- benefits and loads beyond the project life cycle? If no, why not?
	What is the annual production volume of your biobased product?
Eligibility	Are there any local regulations where you operate related to biobased construction?
	If the project is in financial need- provide the audited financial results from the previous year, showing that the project has negative results. Please specify which financial indicator you are using, and the page number within the financial document.
	If the project struggles to gain market share because the costs are higher than conventional construction products- provide a financial analysis of the difference in prices, with and without price subsidies from carbon credit sales
	If the project plans to use funding from carbon credits for investing in or improving operations- provide a business plan for the developments, describing what will be installed/developed, a timeline, and a financial plan (including price quotes, other sources of funding...).
	If the project does not yet exist and its development will be funded by carbon credits- please provide a business plan that describes the project, the timeline, and a financial plan comparing the finances with and without funding from carbon credits. This should show that funding from carbon credits is necessary to develop the site.
	Please evaluate the risk of reversal of carbon storage, along the following 5 criteria: Social, Economic, Environmental, Technical and Administration. See the table in the section C4 - Permanence for more details.
	Provide a signed letter from suppliers (representing >20% of supply) attesting their materials have not already been issued carbon credits
	Provide proof that you have marketing communication/disclaimer clearly stating that carbon credits have already been issued for the product and are managed in the Riverse registry
	Do you use waste biomass or purpose grown biomass? If waste, how much waste biomass goes into producing one unit of your product?

	Does your product have any improved performance over the construction material it replaces (energy, longevity, fire/water resistance…)
	Please provide documentation showing that your product meets the expected performance and technical characteristics to replace the conventional construction material.
	Where does your biomass feedstock come from? What city/region name? How many kilometers away is this from your production site?
	If forestry products are used as biomass- do your suppliers have any sustainability certification?
	For other biomass- please evaluate the risk of environmental harms during biomass cultivation, such as fertilizer, pesticide and water use, and land use competition for other crops.
	Describe any chemical used in the treatment or processing stage.
	Describe the energy used in the treatment or processing stage.

Change log

Description of the change	Justification	Date	Version changed
Short term removal credits (50-100 years) no longer an option	Short term removals have limited value in offsetting GHG emissions, must be sold for offsetting land use change, methane emissions… too risky to track sales and use of credits	23/10/2023	V1.0 to V1.1