

Aim of the factsheet

The benchmark factsheet is designed for companies or investors to assess a sector's impact on biodiversity. Companies can use the factsheet to compare their impacts (e.g. assessed with the Global Biodiversity Score tool) to the sector average or to estimate their impact and main pressures on biodiversity. Also, investors can use it to screen their biodiversity impact, or rate specific companies' performance against sectoral benchmarks. Finally, factsheets will help nourish the work of the EU Green Taxonomy by identifying low impact companies. It is supported by an explanatory appendix.

Sector's stakes

Ecosystem services dependencies of the construction sector

The construction sector is directly dependant on flood and storm protection (dependency score of 53 %) as well as on climate regulation (dependency score of 47 %) and mass stabilisation and erosion control (dependency score of 40 %). However, for all other ecosystem services dependency of the sector does not exceed 40 % (ENCORE 2020).

How does the sector contribute to changes in the state of natural capital ?

The sector affects natural capital through land use change, converting about 1 000 km² of forest and land per year in Europe and half is made impermeable due to concrete and other construction materials (Pelletier et al. 2015). This leads to the loss of the soil's capacity to perform its basic functions (recycling of organic matter, water treatment, carbon storage, etc...). Locally, during the construction period, direct encroachment² (noise) or pollution (spills of paints, solvents, and toxic chemicals) cause additional local impacts on biodiversity (ENCORE 2020). Other spatial pressures are generated by the sector such as fragmentation, especially through linear infrastructure projects, resulting in significant biodiversity loss and potentially to a lasting degradation of ecosystems (CBD 2018).

The materials purchased by the sector and used for construction also impact natural capital. Their production requires raw material extraction which use land and large amount of water.

What does the sector include?

The Construction sector refers to the section F of NACE rev 2, including the general construction and specialised construction activities for buildings and civil engineering works. It includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site and also construction of a temporary nature. This factsheet does not include real estate activities corresponding to the EXIOBASE industry "Real estate (70)".

| EXIOBASE industry | Code NACE rev 2 |
|-------------------|--|
| Construction (45) | F.41 Construction of buildings F.42 Civil engineering F.43 Specialised construction activities |

Moreover, their transformation consumes energy and emits greenhouse gases as well as electricity production whose accounted for 36 % of final energy use and 39 % of energy and process-related CO₂ emissions in 2018 (UNEP & IEA 2018).

Finally, dismantling buildings and infrastructures generates significant waste (220 million tonnes in France according to ADEME) which may be hard to treat, occupies land and leads to diffuse pollution.

Opportunities

Despite the high impact of the sector on biodiversity and the global trends towards urban sprawl, the growing awareness of the sector's impact on natural capital is leading the various stakeholders to take greater account of biodiversity in construction.

Moreover, this awareness can be raised upstream by adopting an eco-conception approach at the design stage to ensure that the materials chosen can be dismantled, reused or recycled (Pays and Jourda 2012), as well as in the planning and design of buildings, which would make it possible to operate on sites where biodiversity is reduced such as brownfield sites, enabling less conversion of natural habitats.

Finally, the European Directive 2010/31 on the energy performance of buildings has defined a common framework of measures aimed at increasing the energy efficiency of buildings by 20% by 2020 to achieve so-called "passive" or "positive energy" buildings, by encouraging energy renovation and green building.

Biodiversity footprint²

Key figures

Scope 1 static terrestrial 0.55 MSA.m²/k€ ~ 4.10 MSAppb/b€ (Scope 1 dynamic terrestrial intensity 0.59 MSA.m²/k€ ~ 4.50 MSAppb/b€)

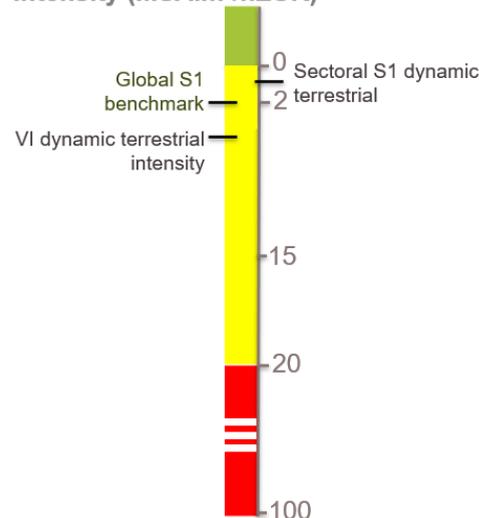
Static terrestrial vertically integrated 210 MSA.m²/k€ ~ 1600 MSAppb/b€ (Dynamic terrestrial vertically integrated 4.9 MSA.m²/k€ ~ 37 MSA.ppb/b€)

Ecosystem services dependency score:

| | |
|------------------|------|
| Scope 1 | 17 % |
| Upstream Scope 3 | 14 % |

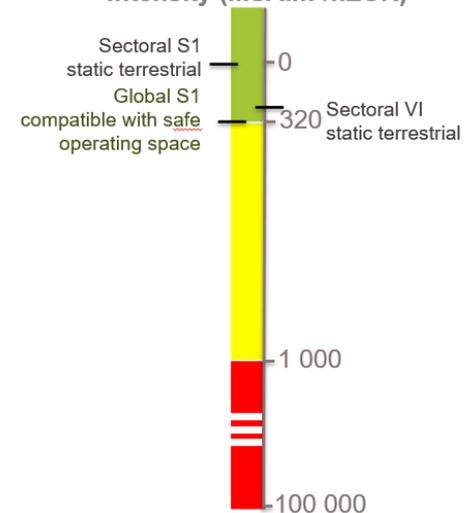
Dynamic terrestrial performance of the sector

Intensity (MSA.m²/kEUR)



Static terrestrial performance of the sector

Intensity (MSA.m²/kEUR)



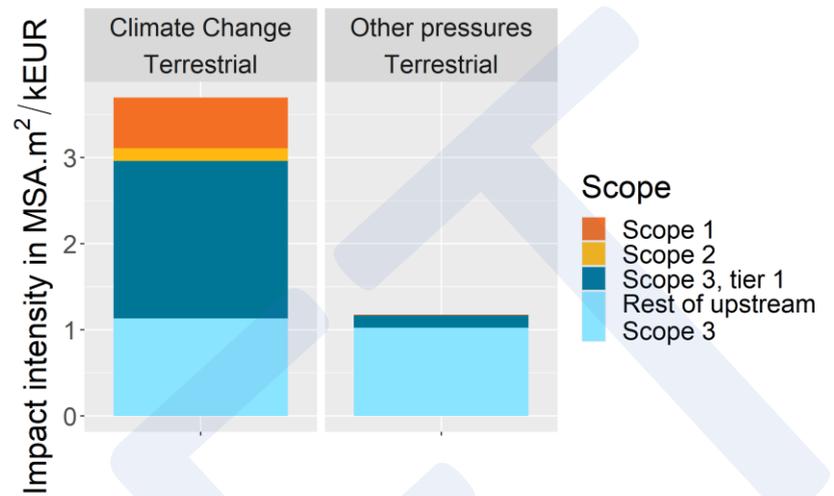
VI : Vertically integrated
S1 : Scope 1

1. "Construction" and "infrastructure maintenance contracts" are the ENCORE processes included in the "Construction & Engineering" and "Homebuilding" sub-industries.
2. The figures and graphs currently do not include most of the Land use impact drivers in Scope 1. However, a first estimation is available on the technical appendix in the "Sector's Scope 1 impact on land use" section.

Biodiversity footprint (continued)

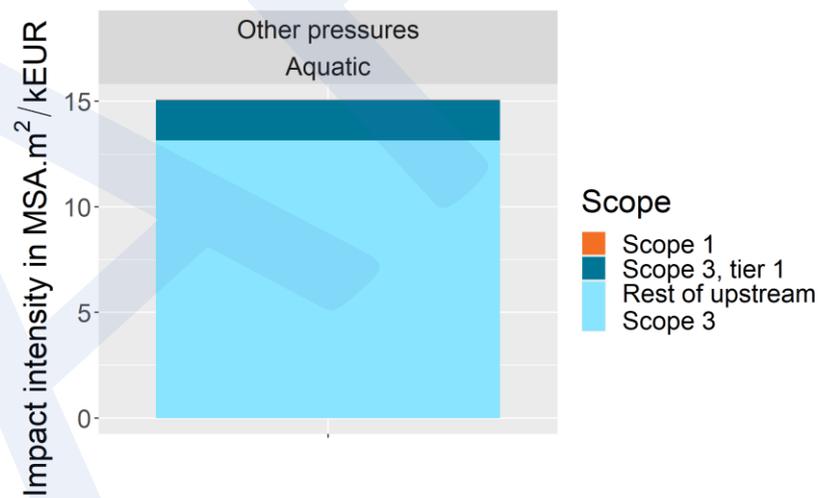
| | | Impact intensity - MSA.m ² /kEUR | |
|-------------|---------|---|-----------------------|
| | | Scope 1 | Vertically integrated |
| Terrestrial | Dynamic | 0.59 | 4.9 |
| | Static | 0.55 | 210 |
| Aquatic | Dynamic | 3.8.10 ⁻⁵ | 8.10 ⁻² |
| | Static | 0.02 | 15 |

Dynamic Terrestrial impact intensity



Source: GBS 1.2.2 computation, Oct 2021

Static Aquatic impact intensity



Source: GBS 1.2.2 computation, Oct 2021

Scope and industry breakdown

According to the graph, the Scope 3 of dynamic terrestrial impact is the most important, especially the rest of upstream Scope 3. This is due to the sector's reliance on other sectors for primary raw materials, for which extraction processes are more impactful.

Note that the figures and graphs only include raw material extractions for the Land use impact drivers in Scope 1. An estimation of the Scope 1 Land use is detailed in the technical annex.

The sector's upstream footprint is largely due to its commodities requirements, in this order: wood logs, crops, grazing and oil and gas commodities (see additional result section of the technical appendix for more details). However, in the 1.2.2 version of the GBS, sand and gravel commodities are underestimated which explains why wood logs and crops have a greater impact than metal mineral and coal commodities. A focus on the construction materials such as concrete is available in the "Additional results" section of the technical appendix, highlighting their impacts.

For the static aquatic pressures, the rest of upstream Scope 3 is also the most important.

The sector contributes to changing the state of the natural capital through different impact drivers. Land use change is one of the main impact driver for the sector. However, these graphs present a limited perimeter of data, an additional assessment focused on Scope 1 land use impacts caused by the sector is provided in the technical annex.

Terrestrial dynamic impacts are due to:

- Climate change: 76 %
- Land Use : 23 %

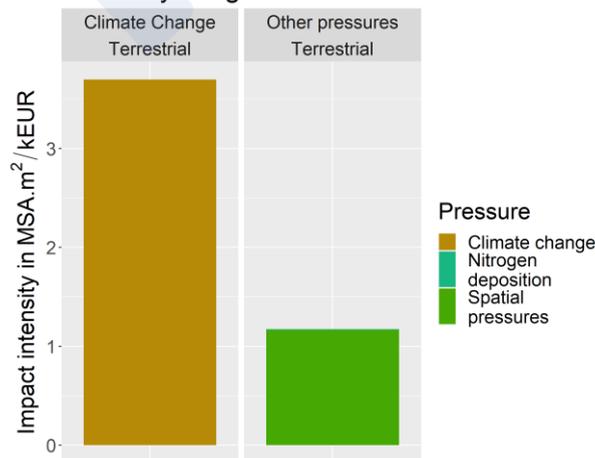
Terrestrial static impacts are due to:

- Land use : 82 %
- Encroachment : 15 %

Aquatic static impacts are due to:

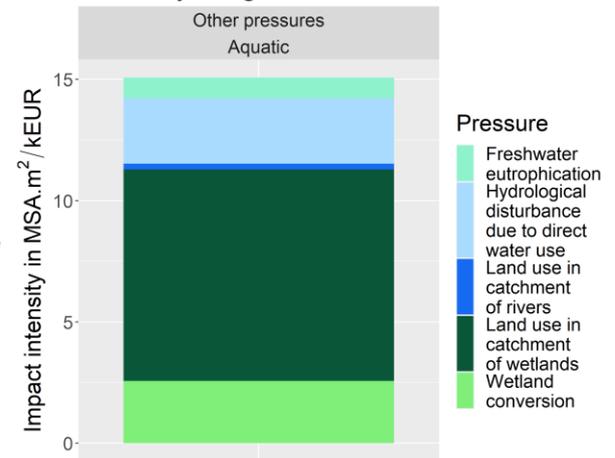
- Land use in watersheds : 58 %
- Wetland conversion : 17 %
- Hydrological disturbance : 18 %

Dynamic Terrestrial impact intensity Vertically integrated



Source: GBS 1.2.2 computation, Oct 2021,

Static Aquatic impact intensity Vertically integrated

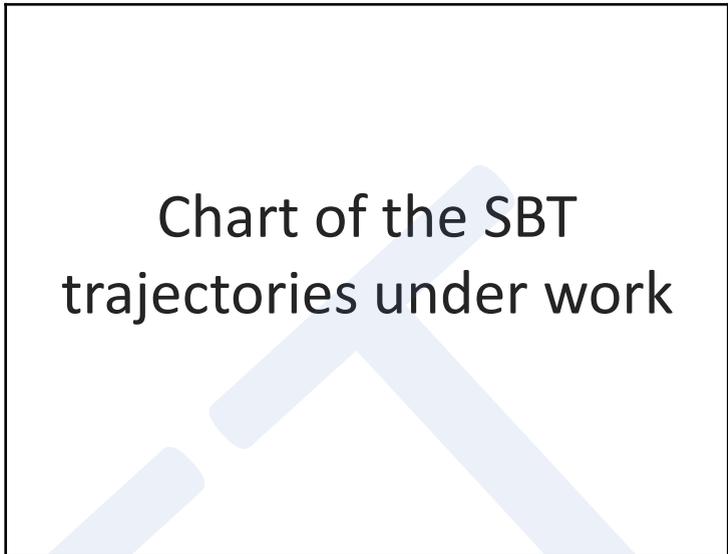


Source: GBS 1.2.2 computation, Oct 2021,

Science-Based Target for Biodiversity (SBT)

The global post-2020 biodiversity framework aims to reach at least a global no net loss of biodiversity in 2030 (interpreted as a global dynamic impact of 0 in 2030) and restore biodiversity between 2030 and 2050 (interpreted here as return to the “zone of functional integrity of the Earth system” by 2050)¹. This global budget needs to be allocated to economic sectors and companies. Different allocation approaches (listed below) can be used to allocate efforts: these methods lead to different sectoral trajectories.

| Allocation | Approach | Data used |
|-------------|-----------------------------|---|
| Equality | Everyone has the same right | Number of employees in the sectors (2010) |
| Efficiency | Cost-effectiveness | Cost of restoration (€.MSA/m ²) |
| Capability | Industries’ ability to pay | Turnover (M€) (2011) |
| Sovereignty | Grandfathering | 2020 dynamic impact (MSA.km ² /year) |



Possible actions to reduce the impact on biodiversity¹

The following recommendations apply to the construction sector but also to the whole value chain (reminder: real estate activities are not included in the factsheet). Some of them can therefore concern and be implemented by other sectors of activity.

| | |
|---------------------------|---|
| Scope 1 | <ul style="list-style-type: none"> Encourage renovation of old or unoccupied buildings Design the site to create new and maintain existing ecological corridors Design the site to include green spaces and infrastructures to attract biodiversity Ensure construction area do not disturb ecological continuity Favour architectural designs that minimise land use Apply the mitigation hierarchy (avoid reduce compensate) to all impacts from construction activities Limitate noise and encroachment during the construction phase |
| Scope 2 | <ul style="list-style-type: none"> During the construction phase, use renewable electricity with demonstrated low impact on biodiversity Optimise construction process to reduce energy consumption |
| Upstream scope 3 | <ul style="list-style-type: none"> Use alternative materials to remove traditional concrete whenever it’s possible Source materials from suppliers with environmental certifications (FSC, Rain Forest alliance etc.) when possible Use construction materials that attract species such as porous surfaces that can be a support for insects, moss, etc. Include biodiversity criteria in site selection. Favor areas with lower biodiversity, that are not home to endangered species and away from protected areas. |
| Downstream scope 3 | <ul style="list-style-type: none"> Optimise for easy to dismantle infrastructures and recyclable materials Use local and renewable electricity with demonstrated low impact on biodiversity to power the building Restore the site at the end of the construction’s life. Remove objects that inhibit ecological continuity, restore soils permeability, increase the vegetal cover Continue to improve the recyclability of construction waste and improve their use Optimise the building’s energy consumption (durable insulation, use of natural light, cleaner energy...) |

Environmental safeguards

Some impacts and pressures are not covered by the figures displayed in this benchmark factsheet (partly due to limitations in the Global Biodiversity™ Score tool used to obtain them). They should not be ignored when defining the biodiversity action plan. For example:

- Avoid locating activities on or near sites of high environmental value or establish a specific management plan. For instance, avoid deforestation and encroachment on protected areas for livestock or crop production (in Brazil, Congo, etc.);
- Take measures to limit the spread of invasive species, particularly during the transport of marine species. Implement measures to detect and eradicate such invasions.

The Platform on Sustainable Finance’s (PSF) draft technical screening criteria for the green taxonomy describes conditions for activities within the “Construction” sector making a significant contribution to environmental objectives, such as:

- Transition to circular economy : the activity “construction of civil engineering objects” should reach at least 90 % (by weight) of non-hazardous construction waste generated on the site prepared for re-use or recycling.
- Protection and restoration of biodiversity and ecosystem : the activity “construction of new buildings and major renovations of buildings” should respect the mitigation hierarchy and keep a given share of areas dedicated to natural areas and permeable.

The PSF’s draft also describes in further details conditions of Do No Significant Harm (DNSH) for these objectives and the remaining significant contribution criteria. They are reported in the benchmark factsheet’s technical annex.

1. Pays & Jourda, 2012
2. Impacts generated on the area controlled by the entity and other impacts directly caused by the entity during the period assessed.
3. Impacts resulting from non-fuel energy (electricity, steam, heat and cold) generation, including impacts resulting from land use changes, fragmentation, etc.
4. Impacts due to the activities of the company but resulting from sources not owned or controlled by the company, both upstream and downstream of its activities.
5. Includes downstream transportation and distribution, processing of sold products (by downstream companies buying them), operations of assets leased to other entities, franchises and investments.

Biodiversity Footprint Assessment

General objectives of a GBS-based assessment

- To assess quantitatively the biodiversity footprint generated by the activity of the company or portfolio and to assess the contribution of the company to global biodiversity erosion;
- To understand what are the main impact drivers on biodiversity the company is responsible for;
- To provide elements for a short-term and a mid-term action plan to reduce the footprint on biodiversity and alleviate the contribution of the company to biodiversity erosion

To anticipate future mandatory biodiversity footprint disclosure in France and in the European Union (action 30 of the French National Biodiversity Plan, post-2020 Biodiversity Agenda)

Limitations: The assessment does not consider some pollution impact drivers nor the existence of invasive species, the impacts on genetic and marine biodiversity

Data: Calculation based on data from the input-output table and the environmental extensions of EXIOBASE 2011 and the impact factors developed by CDC Biodiversité

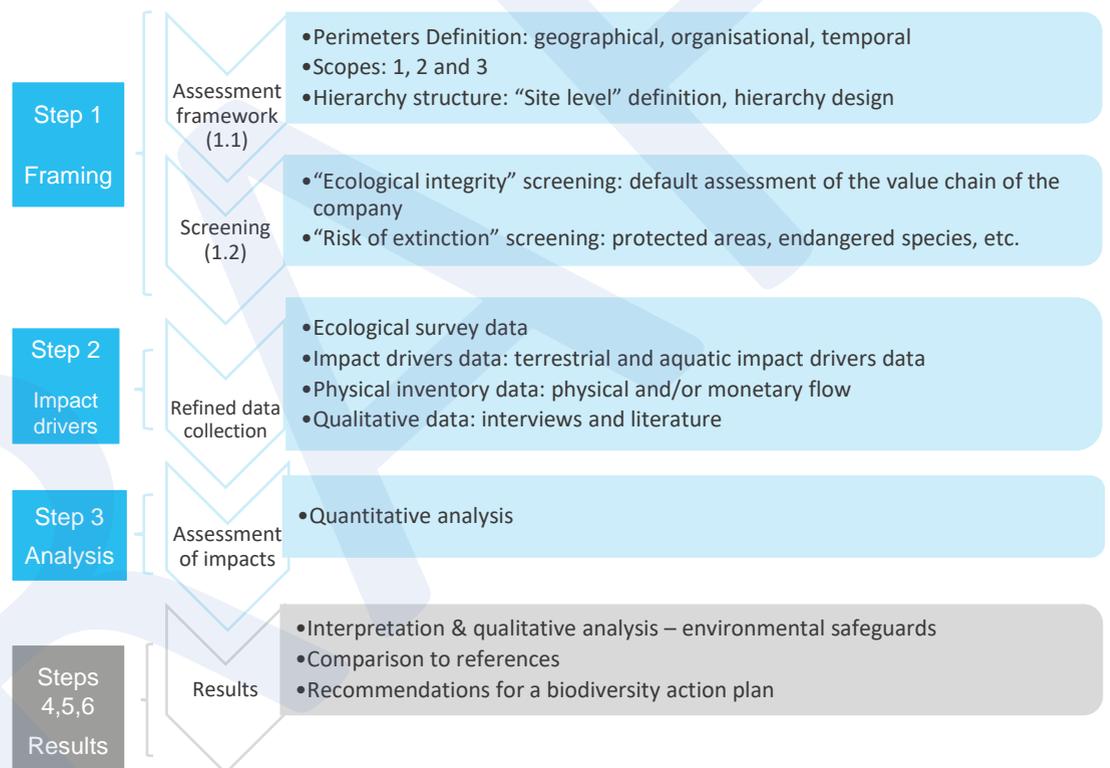
How to lead a Biodiversity Footprint Assessment based on the Global Biodiversity Score?

A GBS-based assessment can be led by various organisms:

- The company itself
- A service-provider, instructed by the company
- A non-financial rating agency

The relevance of the assessment depends on:

- The inclusion of direct operations and value chain impacts on natural capital
- The consistency and transparency of the data and methodology used
- The appropriate quality assurance and complete disclosure of the results



Key messages

- A highly impactful industry for which most impacts occur within the upstream Scope 3.
- The materials used have a significant impact on the pressures of the sector. **Selecting biomaterials** can help to reduce this impact.
- The key impact drivers to monitor and reduce mainly concern the Scope 3 and are **land use and climate change** for terrestrial impacts whereas for the aquatic impacts, the key driver is linked to **water pollution**.

Factsheet version 1.0, February 2022. GBS computations: GBS 1.2.2, October 2021, Alexis Costes.

Content are under the [Creative Commons Attribution-NonCommercial 4.0 International \(CC BY-NC 4.0\)](https://creativecommons.org/licenses/by-nc/4.0/) license except for results from ENCORE data which are licensed under the [Creative Commons Attribution-ShareAlike 4.0 International \(CC BY-SA 4.0\)](https://creativecommons.org/licenses/by-sa/4.0/) license. [Contact us](#) for commercial uses or feedback.

More information

About the GBS: <https://www.cdc-biodiversite.fr/gbs/>

About the factsheets: <https://www.mission-economie-biodiversite.com/actualites/fiches-benchmark-benchmark-factsheets>

Measuring the contributions of business and finance towards the post-2020 global biodiversity framework (CDC Biodiversité, 2020)

Establishing an ecosystem of stakeholders to measure the biodiversity performance of human activities (CDC Biodiversité, 2021)

The sources are referenced in the section "Construction" of the [technical appendix](#).