

ANALYSIS OF THE IMPACT OF A STOXX EUROPE 600 PORTFOLIO ON BIODIVERSITY

USING THE BIODIVERSITY IMPACT
ANALYTICS POWERED BY THE GLOBAL
BIODIVERSITY SCORE DATABASE

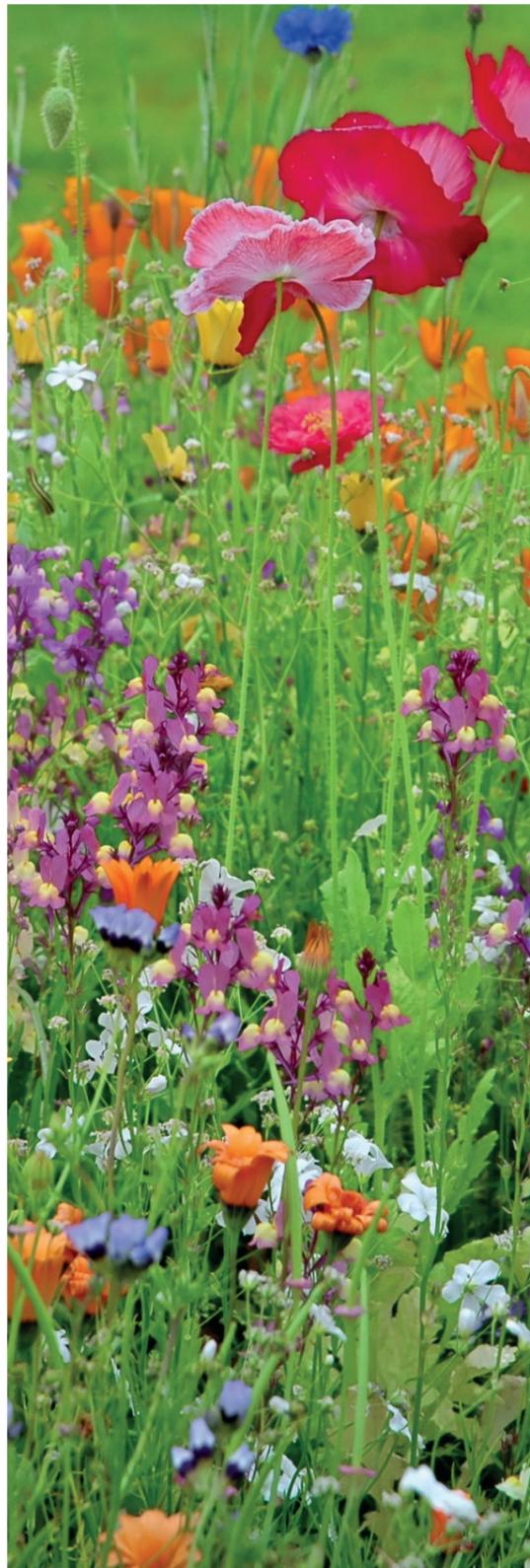
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CONTEXT

Biodiversity-related financial risks are an emerging topic for financial institutions, as the financial community has started to pay attention to the economic consequences of biodiversity loss and degradation of ecosystems. As a way to understand and quantify the relationship between ecosystems and economic actors, Carbon4 Finance and CDC Biodiversité co-developed BIA-GBS to measure companies', sovereign entities' and portfolios' contributions to the degradation of ecosystems, as well as their dependencies on the ecosystem services provided by the environment. The indicators provided by BIA-GBS allow financial institutions to understand an entity's exposure to biodiversity-related transition and physical risks. BIA-GBS is built upon the Global Biodiversity Score (GBS), a methodology created by CDC Biodiversité.

Indeed, in 2020, after five years of development, CDC Biodiversité took part in the profound change required to reverse the trend of biodiversity loss by releasing the Global Biodiversity Score (GBS), a biodiversity footprinting tool that measures the impact of companies on biodiversity across their entire value chain. The methodology was developed in close collaboration with the members of the B4B+ Club (Business for Positive Biodiversity Club), a collective of companies and financial institutions willing to quantitatively measure their impact on biodiversity. The first version of the GBS was released in May 2020. Since the first assessment, conducted by Schneider Electric in 2020, more than 40 companies have assessed their impact on biodiversity. In this context, financial institutions need accurate biodiversity data on listed assets portfolios. CDC Biodiversité partnered with Carbon4 Finance, a pioneer and leader in climate data and methodologies, to create the Biodiversity Impact Analytics powered by the Global Biodiversity Score (BIA-GBS) database.

This paper provides an in-depth analysis of the results provided by BIA-GBS for 1 billion euro in turnover, divided between the STOXX Europe 600's components, based on their weighting in the index.



BIA-GBS IN SHORT

KEY-CONCEPTS OF THE GBS

The GBS is a corporate biodiversity footprint assessment tool: it can be used to evaluate the impact⁽¹⁾ or footprint of companies and investments on biodiversity. The results of assessments are expressed in the MSA.km² unit, where MSA is the Mean Species Abundance, a metric expressed in % characterising the intactness of ecosystems. MSA values range from 0% to 100%, where 100% represents an undisturbed pristine ecosystem. To break down impacts across the value chain, the GBS uses the concept of Scope, or value chain boundary.

In terms of time accountancy, the GBS distinguishes the dynamic and the static impacts. Dynamic impacts are periodic gains or losses, *i.e.* flows of new impacts occurring within the period assessed (Endangered Wildlife Trust 2020). They describe changes, degradations, or restorations of ecosystems during the period assessed⁽²⁾. Static impacts are cumulated negative impacts until the period of assessment.

The GBS links economic activity to pressures on biodiversity and translates these pressures into biodiversity impacts, using state of the art and transparent scientific knowledge. The tool uses company specific data on turnover, purchases or pressure-related, such as land use changes or greenhouse gas emissions.

THE BIA-GBS DATABASE

In BIA-GBS, two climate databases created by Carbon4 Finance are used to assess the impact of listed assets on biodiversity. First, Carbon Impact Analytics (CIA) provides an assessment of greenhouse gas (GHG) emissions over the whole value chain, using bottom-up data, *i.e.* company-specific data, collected by Carbon4 Finance. In BIA-GBS, this value chain-wide greenhouse gas emissions data is processed in the GBS to calculate the climate change related impact on biodiversity. Then, Climate Risk Impact Screening (CRIS) assesses the exposure of listed assets to climate-related physical risk. It provides a breakdown of the issuers' turnover by sector and country. This economic data is used to evaluate the impact on biodiversity for pressures excluding Climate change. Figure 1 details the articulation of the different databases used in BIA-GBS.

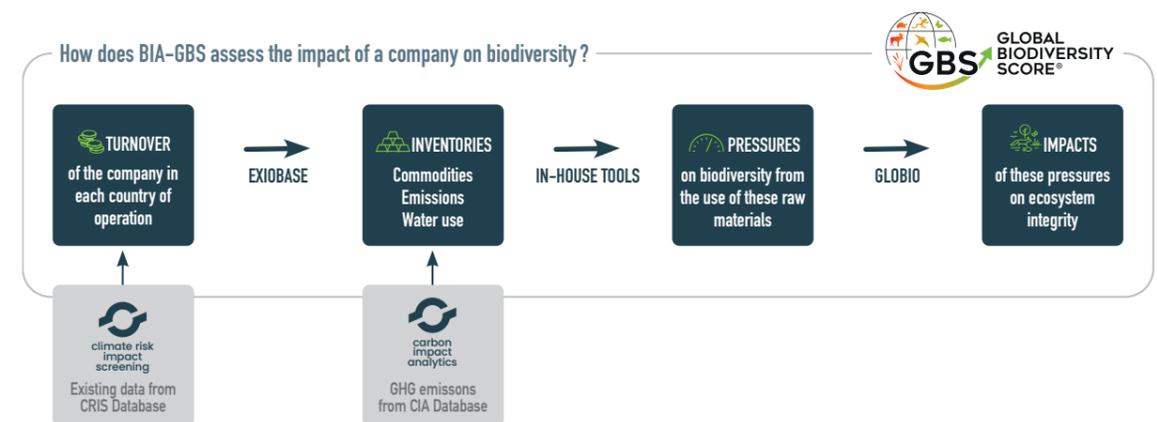


Figure 1: Simplified methodology of BIA-GBS

(1) Dependencies are also assessed, but they will not be included in this study.

(2) For climate change related impacts, technical and accounting limitations result in the partial inclusion of impacts that will occur in the future.

ANALYSIS OF THE RESULTS

GOALS OF THE STUDY

The purpose of this exercise is to analyse the impact on biodiversity of a portfolio that replicates the STOXX Europe 600 Index. With 600 components, the STOXX Europe 600 Index represents large, mid and small capitalization companies across 17 European countries. This study evaluates the impact of 1 billion euro of turnover achieved by STOXX Europe 600 companies, broken down according to the respective weight of each issuer in the index. Issuers from the construction sector were excluded from this study due to lack of coverage in the GBS, which is part of the ongoing improvements of the tool. Thus, the final sample includes 571 issuers accounting for 98% of the STOXX Europe 600 in monetary terms. The results were computed with the version 1.3.0 of the GBS, with the composition of the STOXX Europe 600 by the end of 2021. Using the 57 EXIOBASE Industry Groups, the sectoral distribution of the turnover appears as follows:



Figure 2: Distribution of the turnover per EXIOBASE industries for €1b of turnover achieved by STOXX Europe 600 companies
The «other» category covers sectors accounting for less than 1% of the turnover.

All results are expressed in terms of intensity per euro of turnover, e.g., an average of the issuers' intensity of impact per euro of turnover weighted by their share in the portfolio. The impacts include the Scope 1, 2, upstream Scope 3 and downstream Scope 3 for the impacts related to climate change. Static and dynamic impacts on the one hand, and aquatic and terrestrial impacts on the other hand are reported separately. However, the MSAppb* score has been used in this analysis to screen for impact hotspots by aggregating the four associated compartments (static, dynamic, aquatic, terrestrial). The underlying methodology is described in the Box 1⁽³⁾.

(3) A more detailed explanation is available in the BIA-GBS methodology guide. Please contact us to gain access to this guide.

BOX 1: DESCRIPTION OF THE AGGREGATED SCORE IN MSAPPB*

Figure 3 provides the steps and logical flow followed to build the aggregated score. The formula used is

$$MSAppb^* = Terrestrial\ static \times \frac{10^3}{133} \times \frac{1}{50} + Terrestrial\ dynamic \times \frac{10^3}{133} + Aquatic\ static \times \frac{10^3}{11} \times \frac{1}{50} + Aquatic\ dynamic \times \frac{10^3}{11}$$

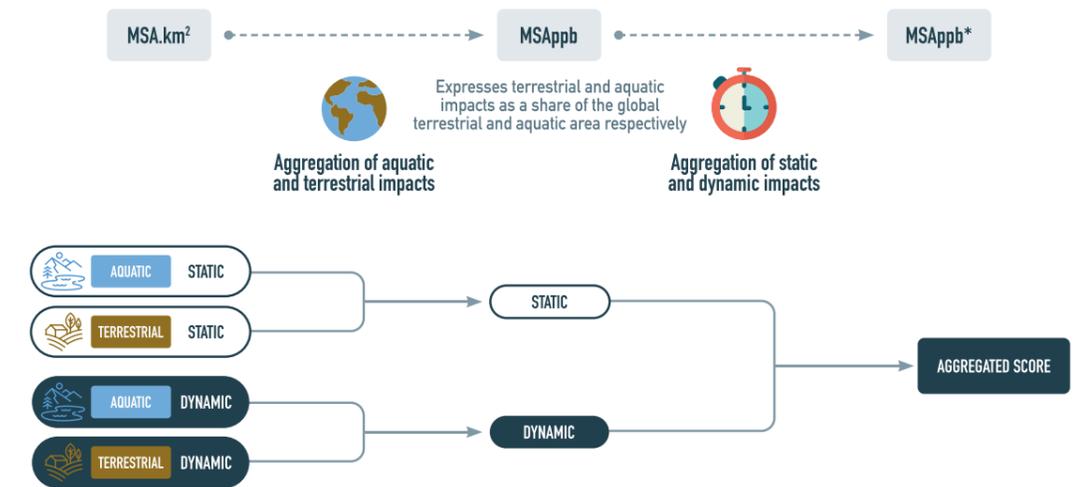


Figure 3: Construction of the MSAppb* aggregated score

PRESENTATION OF THE RESULTS

Using the aggregated score in MSAppb* summed up on the value chain (Scope 1, 2, upstream Scope 3 and downstream Scope 3 related to climate change), the four most impactful sectors in the portfolio are Financial service activities, Manufacture of chemicals and chemical products, Manufacture of food products and Manufacture of beverages. Figure 4 shows how two key factors play out in the impacts of each of these sectors: Manufacture of food products and Manufacture of beverages both have a high intensity and a large weight in the portfolio. Financial service activities have an intensity close to the average of the portfolio but a significant weight, while Manufacture of chemicals and chemical products has an intensity slightly below the average of the portfolio but the highest weight in the portfolio. Other industries with very material impact intensities do not stand out because their weights in the portfolio are too low. This is for instance the case of Manufacture of leather and related products.

The intensities are compared to a threshold which stands at 130 MSAppb*/b€ of turnover⁽⁴⁾. This threshold is a first estimate of what could be considered a low-impact activity on average. It is built by putting together different types of thresholds for aquatic, terrestrial, dynamic and static impacts and should be considered only as an initial guidance that will need to be refined in the future.

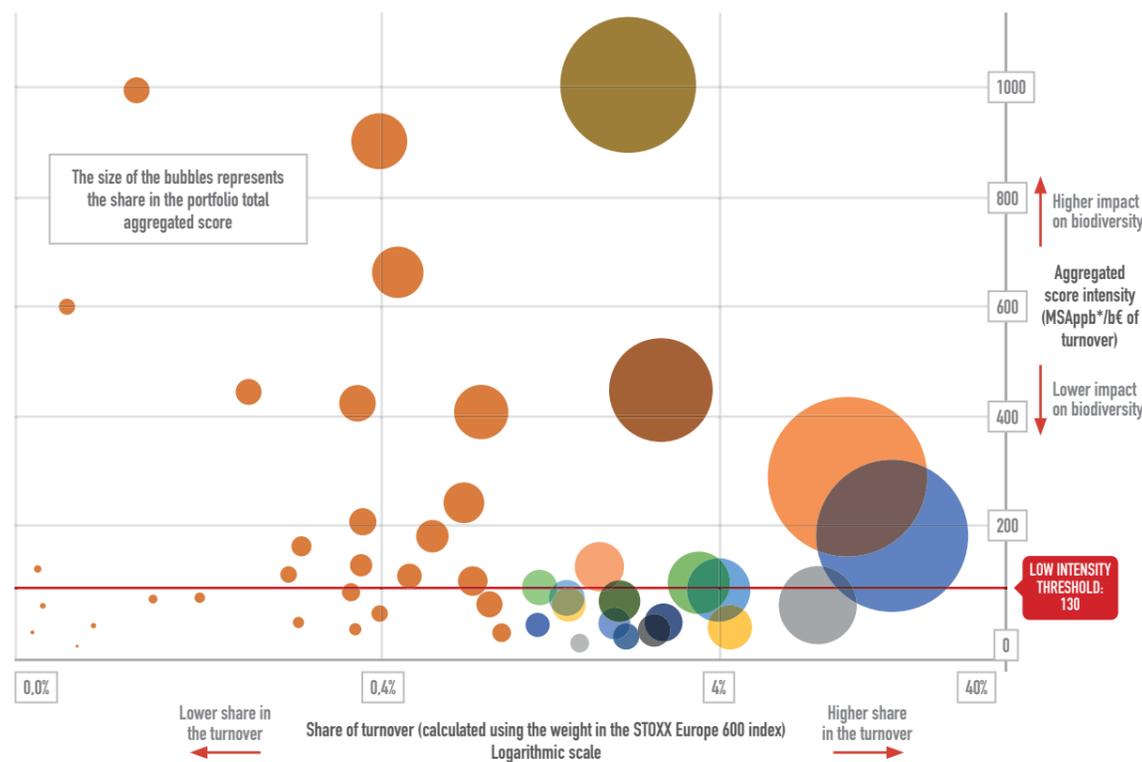


Figure 4: Impact on biodiversity per sector for 1 billion euro in turnover of STOXX600 companies. Source: Biodiversity Impact Analytics powered by the Global Biodiversity Score database, GBS 1.3.0, 09/21, Carbon4 Finance

(4) This intensity was calculated as follows, in MSA.km²/b€ of turnover and then aggregated in MSAppb*/b€ of turnover:
 - Static: Knowing the planetary boundary measured in MSA remaining at world level and the global turnover, it is possible to assess a static intensity target of 320 MSA.km²/b€ of turnover for terrestrial and 27 MSA.km²/b€ of turnover for aquatic.
 - Dynamic: the target intensity is the average intensity corresponding to the business-as-usual scenario. This gives an intensity of 2 MSA.km²/b€ of turnover for terrestrial and 0.2 MSA.km²/b€ of turnover for aquatic.

In addition, and to better understand the impact of the portfolio on biodiversity, it is useful to zoom out of the aggregated score and come back to MSA.m²/kEUR to break down the intensities into its elementary components. The Figure 5 reveals industries with different profiles: some sectors, such as Manufacture of leather & related products, have an important cumulated impact on land use and therefore a predominant static impact. On the other hand, dynamic impacts linked to the Climate change pressure stand out for Financial service activities, as the downstream impact of financed emissions on the Climate change is included.

INDUSTRY GROUP	SHARE IN THE AGGREGATED SCORE	TERRESTRIAL STATIC	TERRESTRIAL DYNAMIC	AQUATIC STATIC	AQUATIC DYNAMIC
Financial service activities	20%	●	●	●	●
Manufacture of chemicals & chemical products	18%	●	●	●	●
Manufacture of food products	15%	●	●	●	●
Manufacture of beverages	8%	●	●	●	●
Manufacture of computer, electronic & optical products	5%	●	●	●	●
Manufacture of machinery and equipment	3%	●	●	●	●
Electricity, gas, steam & air conditioning supply	3%	●	●	●	●
Manufacture of leather & related products	2%	●	●	●	●
Mining of metal ores	2%	●	●	●	●
Crop & animal production, hunting & related service activities	2%	●	●	●	●
Other	21%	●	●	●	●

Figure 5: Breakdown of impacts per realm and accounting category for each major industry group. Source: Biodiversity Impact Analytics powered by the Global Biodiversity Score database, GBS 1.3.0, 09/21, Carbon4 Finance

BIA-GBS also reveals that most of the impacts of the portfolio are generated within the issuers' (Upstream and, for climate change only, Downstream) Scope 3, which accounts for between 91 % and 97 % of the total impact in MSA.km² depending on the realm (terrestrial or aquatic) and the accounting category (static or dynamic).

BOX 2: HOW TO INTERPRET THE RESULTS IN MSA.KM²?

The breakdown of impacts for one billion euros in turnover of the average issuer (according to the portfolio weight) is as follow:

- ➔ The terrestrial static impact is 310 MSA.km², meaning that **the underlying economic activity cumulated past impacts are equivalent to a surface of 310 km² with no plant or animal**, about the size of Malta.
- ➔ The terrestrial dynamic impact is +11 MSA.km², meaning that **the underlying economic activity generated new impacts equivalent to the destruction of 11 km² of pristine ecosystems**, which is one tenth the size of Paris.
- ➔ Similarly, the aquatic static impact is 23 MSA.km², meaning that **the underlying economic activity cumulated past impacts are equivalent to a destructed surface on freshwater ecosystems of 23 km²**.
- ➔ The aquatic dynamic impact is not **usually interpreted** as it is subject to **more uncertainties** in the current version of the methodology.

ANALYSIS OF THE MAIN PRESSURES

The pressures covered in BIA-GBS are Land use, Fragmentation of natural ecosystems, Human encroachment, Atmospheric nitrogen deposition, Climate change, Hydrological disturbance due to direct water use and climate change, Wetland conversion, Freshwater eutrophication, Land use in catchment of rivers and wetlands. These pressures cover four of the five impact drivers listed by the IPBES⁽⁵⁾.

The main pressures in the portfolio result are Land use and Climate change⁽⁶⁾, which account for 80 % of the average aggregated score intensity per turnover. Figure 6 shows the distribution of the ten most intensive sectors according to the share of these two pressures in the aggregated score.

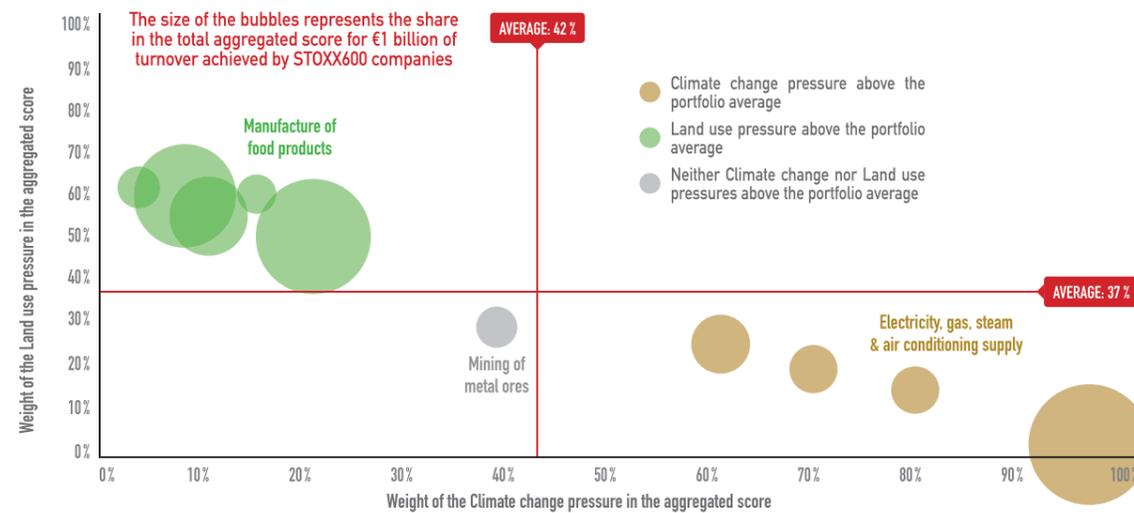


Figure 6: Share of the Land use and Climate Change pressures in the aggregated score of the ten most intensive sectors⁽⁷⁾, for 1 billion euro in turnover of STOXX Europe 600 companies. Source: Biodiversity Impact Analytics powered by the Global Biodiversity Score database, GBS 1.3.0, 09/21, Carbon4 Finance

The Climate change pressure is predominant for four of the ten largest sectors in terms of contribution to the aggregated score. More than 95% of the intensity of the Financial service activities sector comes from the Climate change pressure. This raises the predominance of this pressure at the portfolio level as this sector accounts for 20% of the portfolio's intensity and 12% of its financial weight. This significant share of Climate change in the biodiversity impact of the Financial sector is explained on the one hand by the inclusion of its Downstream Scope 3 GHG emissions (those caused by the companies financed by financial institutions) and associated Climate change impacts, and on the other hand by the current lack of assessment of other downstream Scope 3 pressures in BIA-GBS.

The Land use change pressure is the main driver for five out of ten of these sectors, including the agri-food and leather industries. These activities are associated to significant land occupation (and thus high Land use static intensities), required to grow crops and grass for humans and livestock.

(5) See <https://www.cdc-biodiversite.fr/publications/global-biodiversity-score-update2021-cahier18/> for a description of these pressures and the correspondence table with the IPBES driver impacts.

(6) As a reminder, Climate change static impacts are not assessed.

(7) Mining involves disturbance to surrounding ecosystems, which is captured by the Encroachment pressure that therefore represents a much higher share of Mining's impacts than for other industries. The pressure linked to water use is also higher than the average.

CONCLUSION & PERSPECTIVE FOR DEVELOPMENTS

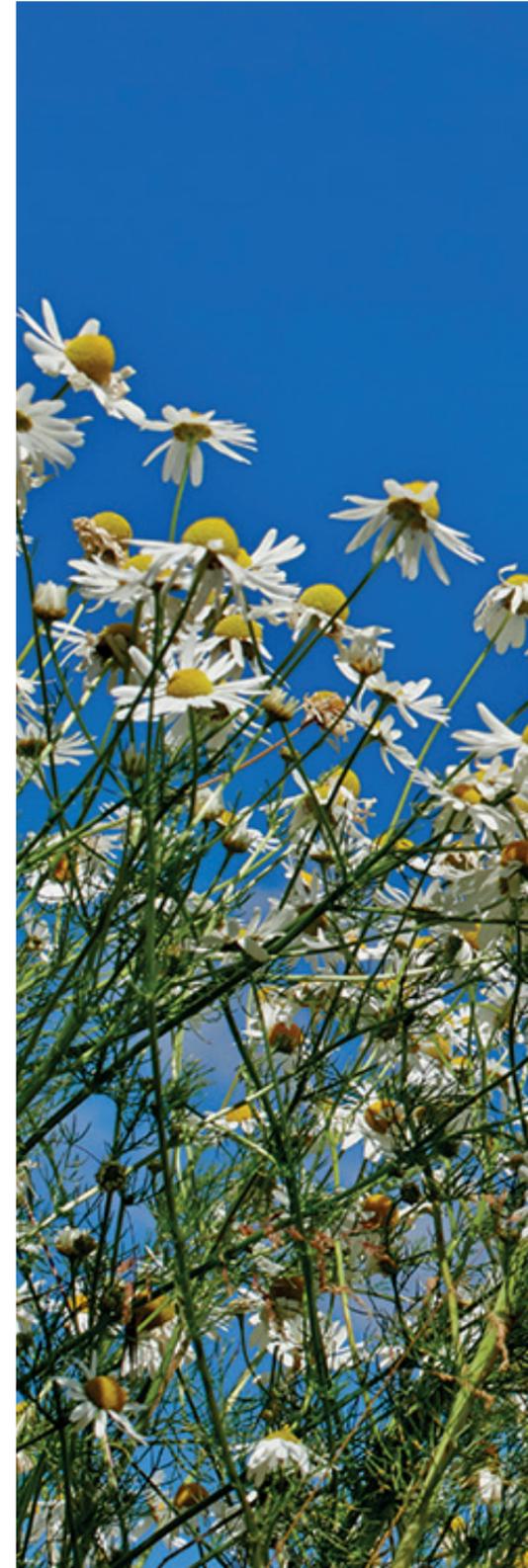
Biodiversity emerged as a growing concern for the financial world: time is of the essence to reverse biodiversity loss and the financial sector must act now. The Finance for Biodiversity Pledge was launched in September 2020 by financial institutions around the globe to call and commit to act on biodiversity⁽¹⁾. This Pledge has since been signed by more than 100 financial institutions, which are committed to measuring their impact on biodiversity.

BIA-GBS gives the financial sector and Pledge signatories the data it needs to meet such engagements: detailed analysis of the impact of portfolios on biodiversity, with multiple explanatory variables (ventilation per sector, pressure, and biodiversity realm). This database provides the foundations on which financial institutions can rely to report on biodiversity, with a good connection to the frameworks under development. For example, pilots are underway to analyse how BIA-GBS enables reporting that complies with the Taskforce on Nature-related Financial Disclosure (TNFD) framework.

The database can also be used to steer a biodiversity strategy, engage with issuers or companies, and begin to set targets as it provides a detailed line-by-line analysis of the impact of a portfolio. CDC Biodiversité supports financial institutions in developing and monitoring such strategies through dedicated consulting services.

Finally, BIA-GBS continues to progress to provide more answers to the biodiversity challenges of the financial sector. Since 2022, development work has been underway to use company-specific inventories data for all pressures, which will allow best-in-class selection, beginning with the agri-food sector. A methodology to assess the sovereign entities, as well as the screening of biodiversity dependencies, were also added to the database.

(1) <https://www.financeforbiodiversity.org/>





Carbon4 Finance is an environmental data specialist which offers a complete set of climate data solutions covering both physical and transition risks, as well as biodiversity footprint with BIA-GBS.

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CDC Biodiversité is a French consulting and engineering firm specialized in positive actions for biodiversity, biodiversity sustainable management, and measurement of corporate biodiversity footprint. It is a private subsidiary of the Caisse des Dépôts et Consignations Group, the biggest public financial institution in France.

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