Schneider Electric's Biodiversity Footprint Assessment with the Global Biodiversity Score

GENERAL INFORMATION

Biodiversity measurement tool	**Global Biodiversity Score (GBS)**
Company	**Schneider Electric**
Sector	Manufacture of electrical equipment
Turnover	27,2 billion EUR
Date/Period of measurement ((year(s))	01/01/19 to 31/12/19

Business application(s)

BA 1: Assessment of current biodiversity performance	
BA 3: Tracking progress to targets	Schneider Electric is starting to think about a Science-Based Target (SBT) and will take its final decision on the ambition of this target in the coming months. The assessment was used to evaluate the alignment with this target. The unit MSA.km² (see summary description of tool) is indeed a metric relative to ecosystem integrity, which is being considered within the

	Science-Based Target Network (SBTN). The GBS can be used to Measure, Set & Disclose (step 3 of the SBTN Interim Guidance): measure impacts and express them in MSA.km², set a target of impact reduction in MSA.km² or in % of the footprint in a specific year (e.g. –30% compared to 2019 by 2030). It can also be used to disclose impacts regularly. On top of that, preliminary assessment of the planetary boundary for terrestrial biodiversity have been conducted and expressed in MSA (Lucas & Wilting 2018): even though these works require significant additional research, they provide the foundations to set scientifically meaningful targets.
BA 7: Screening and assessment of biodiversity risks and opportunities	Screening of the ecological integrity risks, i.e. the risks of impacting ecosystem integrity (as measured by the MSA.km² unit). In turn, risks of impacts on biodiversity translate into business risks (e.g. reputational, regulatory, financial) or possibly legal.
BA 8: Biodiversity accounting for internal reporting and/or external disclosure	Biodiversity accounting for external audited disclosure, by external auditors of non-financial information whose role is to make sure that non-financial disclosures are trustworthy.

Organisational Focus Area (site, product, supply chain, …)

OFA 5: Corporate level	Covering whole value chain from cradle to grave

DESCRIPTION OF THE CASE

See summary description of methodology here

Context

As a global specialist in energy management and automation in more than 100 countries, Schneider Electric offers integrated energy solutions across multiple market segments. Sustainability is at the heart of its strategy, and it has recently started its biodiversity journey. For Schneider Electric, this evaluation was therefore an opportunity to quantify biodiversity risks and opportunities for reducing theses risks all along its value chain, with a global and scientific approach.

Boundaries

The perimeter of the assessment is the whole value chain (from cradle to grave). However, downstream impacts are limited to those caused by climate change, due to data and methodological limitations. As in carbon accounting, impacts of direct operations are included in Scope 1. Impacts of energy purchases are included in Scope 2. Impacts of other purchases are included in upstream Scope 3, while impacts of product life and end of life are included in downstream Scope 3.

To account for impacts lasting beyond the period assessed, impacts are split into dynamic – periodic gains/losses occurring within the period assessed – and static – persistent impacts or stock of accumulated losses.

Three overarching types of biodiversity are usually distinguished: terrestrial, aquatic (lakes, rivers, wetlands) and marine (oceans and seas). Marine biodiversity is not covered by the GBS (due to lack of scientific data) and is therefore not included in this assessment. Marine biodiversity is not considered to be a material impact of the direct operations of the electrical machinery industry (for instance ENCORE does not list any impacts on marine biodiversity for this industry). But impacts related to sea transport in its supply chain may be material.

Location and scale

The assessment is not made at the site level but at the company level, over the whole value chain. There is therefore no specific location or map. For Scope 1 alone, it corresponds to an area of over 100ha.

Types of pressures[1]

Pressures	Terrestrial	Freshwater	Marine
Land use change	Land Use, Fragmentation, Encroachment	Wetland conversion	
Climate change	Climate Change	Hydrological disturbance due to Climate Change	
Pollution	Atmospheric nitrogen deposition, Ecotoxicity (assessed but not displayed in results).	Freshwater euthrophication, land use in catchment of rivers and wetlands, Ecotoxicity (assessed but not displayed in results)	
Direct exploitation		Hydrological disturbance due to water use	
Invasive species			
Other			

Collected data on economic activities, pressures, state and impacts[2]

Primary data	Secondary data	Modelled data
Economic data		
Turnover breakdown by industry and country (EUR); Breakdown of direct purchase by procurement category (EUR)	Purchases Tier 2 and more modelled with Global dataset from EXIOBASE Input-Output model (*1)	
Challenges		
Pressures[3]		
Land occupation (Scope 1), volumes of water consumed or withdrawn by site or by country (Scope 1) and GHG emissions (Scope 1,2,3).	Tonnage of metal ores, crude oil and woodlogs purchased; Electricity bought by country and technology, fossil fuel bought for heating.	
Challenges		
For Scope 1 land-use impacts, the evolution of the land occupation from 2018 to 2019 was unknown, only the 2019 land occupation was known. Despite a trend of declining land occupation for Schneider Electric, a conservative assumption (overestimating the impact) of no land use change was considered.	Despite the best efforts, it was impossible to know all quantities of raw material with complete accuracy – especially for fabricated products. It was especially difficult to estimate the recycled content of products. It was not possible to identify where raw material originated from and, as a result, global impact factors had to be used, instead of more precise country impact factors.	

[1] More information on the different pressures in the technical update report (CDC Biodiversité, 2020d)
[2] More information on the use of data and the methodology in the technical update report (CDC Biodiversité, 2020d) and the following critical review documents: Input output modelling (CDC Biodiversité, 2020b), terrestrial pressures (CDC Biodiversité, 2020c), freshwater pressures (CDC Biodiversité, 2020a)
[3] When pressure data is available, it is used to replace the assessment made from economic data. For some pressures (e.g. encroachment) we therefore keep the results from the evaluation made from economic data. See technical report (CDC Biodiversité, 2020d)

Primary data	Secondary data	Modelled data
State		
Challenges		
Impacts		
Challenges		

(*1) EXIOBASE is applied for all tier 2 and higher, i.e. all the purchases of the suppliers, and their purchases, and so on. All countries. EXIOBASE has data until 2011 but GBS application in 2019 assumes a similar structure of the economy as in 2011, cf.GBS technical report.

What was the role of qualitative information?

Studying the impact of recycling, but also the impact of a FSC certification allowed us to have a better vision in order to consider which targets should be set (the target setting process is still ongoing in December 2020). The share of recycled content and share of FSC certified for wood and metals, allowed us to have a better idea of the real impact, since the potential impact had been calculated considering 0% recycled content or FSC certified content. We were therefore able to estimate which targets would be realistic. Since in reality the impact of Schneider Electric is already lower than the calculated one, we estimated how much the impact could be reduced by increasing the share of recycled content and certified content.

Baseline/reference situation

The reference state against which 100% Mean Species Abundance (MSA) is defined, is the undisturbed state (by definition of the MSA metric). This is a totally different concept from the baseline situation. At this stage, since it is the first evaluation of Schneider Electric's activities, there is no baseline. For next assessments, the baseline will be 2019's results.

Required efforts for the measurement

The assessment required about 40-80 mandays from the consultants (CDC Biodiversité and PRé) and about as much from Schneider Electric. Data collection took a significant share of the time, as did the interpretation of results and the exploration of options to reduce impacts. The appropriation of a few new concepts (dynamic, static, aquatic, terrestrial, etc.) by the Schneider Electric teams took time. Furthermore, the fact that the entire value chain is covered implies a large number of figures (4 figures, dynamic aquatic, dynamic terrestrial, static aquatic, and static terrestrial, for Scope 1, Scope 2, Tier 1 of Scope 3, Rest of Upstream Scope 3 , etc.) so it takes time to come up with clear ideas about business performance and reduction options.

Required skills to complete this exercise

A specialised consultant and employees from Schneider Electric have followed a two days training about the GBS.

Results and application

All detailed results can be found in the White Paper on this case study[4] . The figures below only provide some of the relevant outcomes.

Figure 1 presents Schneider Electric's **terrestrial dynamic footprint**. The share of the impact due to climate change is important in the dynamic footprint because the company has a low use of biomass and therefore the impact related to other pressures is limited. There is no land use conversion in Scope 1, therefore the dynamic impact related to Land Use pressure is null in Scope 1. In the static impacts, the shares of impacts due to land use as well as other pressures are more

[4] https://download.schneider-electric.com/files?p_File_Name=Schneider+Electric+Biodiversity+White+Paper+-+September+2020.pdf&p_Doc_Ref=WPBiodiversity&p_enDocType=White+Paper

important. The avoided impacts related to the use of recycled material have not been quantified (qualitative analysis) and are therefore not shown in this graph.

Figure 2 (terrestrial dynamic) and **Figure 3 (aquatic static)** provide orders of magnitude of the **impact intensities** (impact per unit of turnover in MSAm2/kEUR) **through a "green light" system**. They display the impact intensities of an "average company" globally (Global average) and of the Manufacture of electrical machinery and apparatus n.e.c. (not elsewhere classified) industry (Industry average), to which Schneider Electric belongs. The current knowledge on aquatic static impacts (Figure 3) is more limited, and figures are more uncertain.
The figures aim to give some context to understand the performance of the industry and of Schneider Electric, and to provide some background figures on what can be considered high, or low impact intensities. This is a representation we will be using very often so it will become familiar to people. The green area on the figures is the one towards which the company should tend. 'Positive impacts on biodiversity' include avoided impacts but could also include actual gains. The amber area represents an average performance (which is not satisfactory and still causes biodiversity loss). The red area is associated with high impact intensities, which correspond to companies causing significant harm to ecosystem integrity. The boundaries of the greenlight system are set as follow: the red threshold (20 MSAm2/kEUR for terrestrial dynamic impacts, 300 MSAm2/kEUR for aquatic static impacts) is an empirical limit observed by CDC Biodiversité between sectors with very high impacts (extraction, agriculture with deforestation, etc.) and sectors with lower impacts. But of course, different sectors have different impact intensities and some sectors still have to reduce their impacts, even if their aquatic static impact intensity is below 300 MSA.m2/k€.

In **Figure 2 (terrestrial dynamic intensity)**, for Scope 1, Schneider Electric's impact intensity per unit of turnover is 0.03 MSA.m2/kEUR, against a 2011 global sectoral benchmark of 0.06 MSA.m2/kEUR. This sectoral (Manufacturing of electrical machinery and apparatus) benchmark is itself very low compared to the global benchmark of 2 MSA.m2/kEUR, which is driven mainly by raw material extraction and production industries, such as agriculture, logging or extractive industries. However, the upstream impacts are more significant and amount to 0.04 MSA.m2/kEUR for Scope 2, and 1.7 MSA.m2/kEUR for upstream Scope 3. The impact intensity of a hypothetical "vertically integrated" Schneider Electric (summing across Scopes 1, 2 and 3 upstream) amounts to 1.7 MSA.m2/kEUR. This compares to a benchmark for a vertically integrated manufacturer of electrical equipment of 4.9 MSA.m2/kEUR.

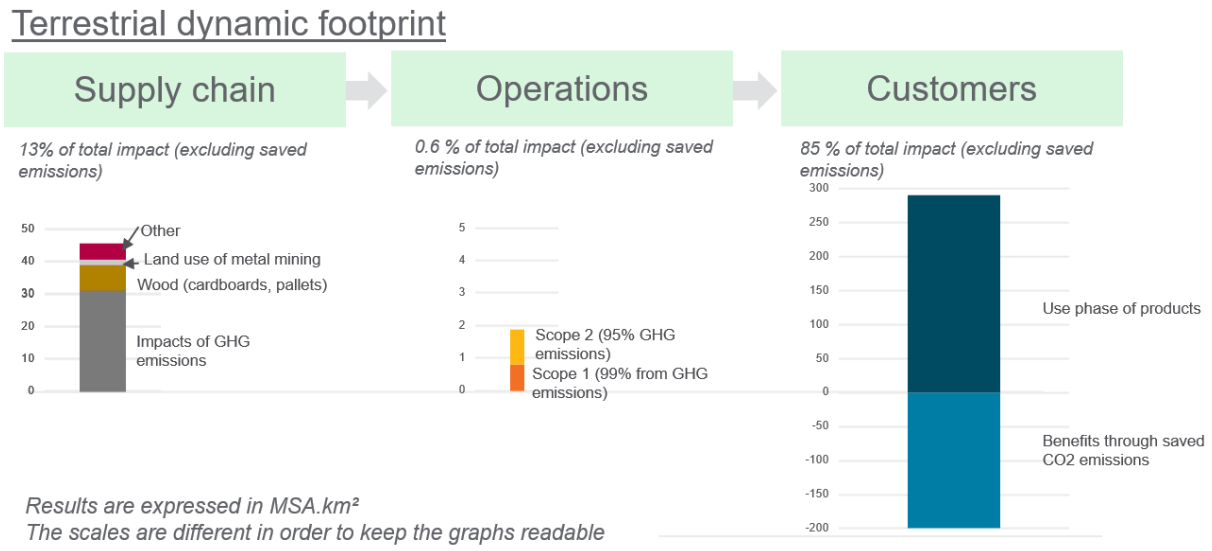

Figure 1 SE_terrestrial_dynamic_footprint

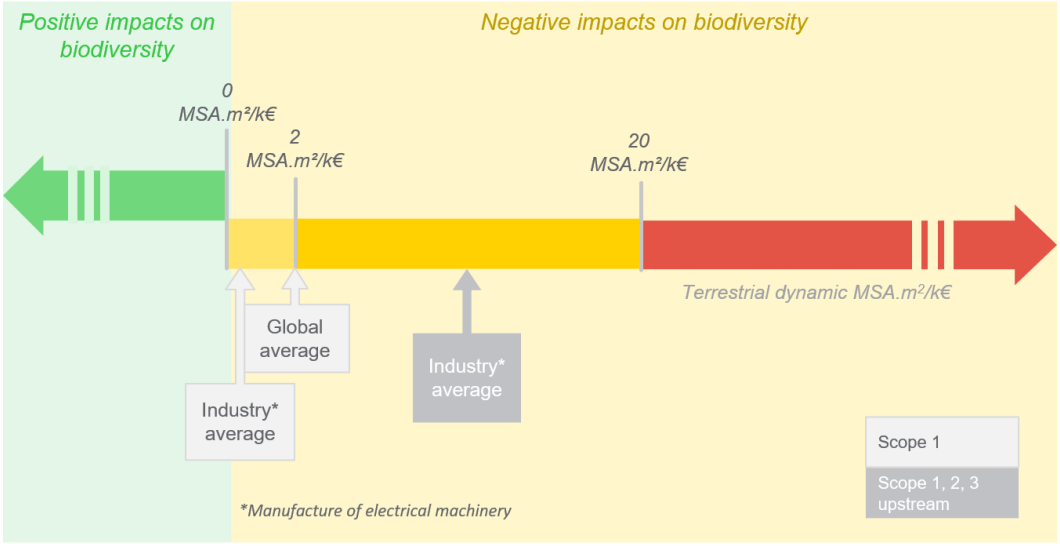

Figure 2 SE_terrestrial_dynamic_greenlight

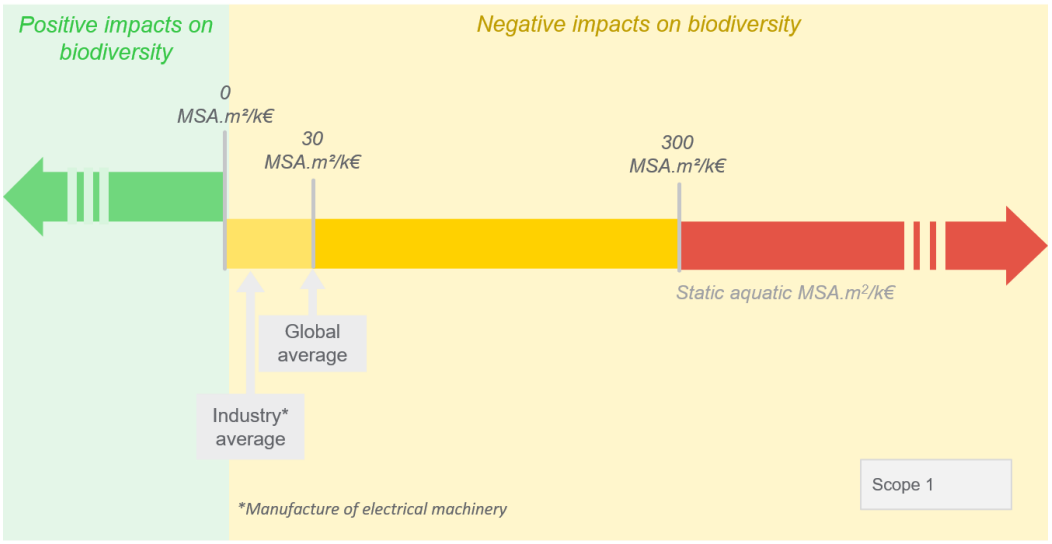

Figure 3 SE_aquatic_static_greenlight

Interpretation of results and impact on decision-making

The results (in the White Paper) show that the most significant part of impacts occurs within downstream Scope 3, which, for Schneider Electric, is due to the CO2 emissions during the use phase of its products. Looking at the craddle to gate footprint, 98% of impacts are caused by the supply chain which is consistent with the industrial role of a manufacturer such as Schneider Electric, ultimately reliant on the extraction of raw materials. For Schneider Electric, climate change is a key driver of biodiversity (dynamic) loss. Within non-climate upstream Scope 3 impacts, wood logs represent about 56% of terrestrial dynamic impacts. For Schneider Electric, wood logs are mainly embedded within cardboard and pallets, with 96% coming from recycled or certified sources. In the assessment however, an average, non-certified, wood was considered and the impacts are likely to be over-estimated as certification can in some cases lead to lower impacts. In any case, further engagement with suppliers will be necessary to obtain assurances of low impacts on biodiversity, as current certifications appear too flexible to ensure systematic reduction in biodiversity impacts. Lastly, Mining of metals represents 17% of non-climate terrestrial dynamic impacts (and 43% of non-climate terrestrial static impacts). At Schneider Electric, the metal with the highest impact on biodiversity (both in extraction and transformation phase) is copper and specific actions with suppliers all along the supply chain are needed to reduce those impacts. (Schneider Electric & CDC Biodiversité, 2020)

Those outcomes from the GBS allowed Schneider Electric to take some decisions and set some goals: besides working on local biodiversity on sites, they aim at avoiding and reducing impacts in their supply chain. Profound transformations are needed, in the way they design their products to allow for more recycled materials. The main areas of action will be, as shown by the results of the assessment, GHG emissions, wood, and mining (both through increased recycling and better mining practices and certifications). Although there are many challenges ahead and high uncertainties, they wish to influence beyond their operational scope, where most of the cradle-to-gate impacts occur.

STRENGTHS AND LIMITATIONS OF THE APPLIED MEASUREMENT APPROACH IN THIS SPECIFIC CASE

Self-assessment

Relevance	
Strengths	• The need of Schneider Electric was to conduct the first stage of a biodiversity footprint assessment for external audited disclosure, to understand its current impact at the corporate level and explore possible targets. This business application is the core use of the GBS. The methodology allows to use the best available data. When available, impacts calculated from pressure data (e.g. land use) or from inventory data (e.g. GHG emissions) will indeed replace impacts calculated from economic data. It therefore takes into account the business context.
Limitations	• For this sector, a substantial part of the impact lies in Scope 3 upstream. Better data on pressures caused by suppliers all along the supply chain are needed to properly assess their impacts.
Opportunities for improvement	• The most material impacts of Schneider Electric have been identified. It allows us to know which data to collect for next assessment in order to better assess Schneider Electric's impacts.
Completeness	
Strengths	• The GBS currently covers direct operations and upstream impacts (cradle to gate) on terrestrial and aquatic (freshwater) biodiversity.
Limitations	• The Mean Species Abundance (MSA) metric does not cover the risk of extinction of species, nor the degradation of the diversity of genes. The GBS also does not cover marine biodiversity, or some pollution types such as plastic waste. Regarding marine biodiversity, the electronic equipment & instruments sector has no impact on marine biodiversity in ENCORE (https://encore.naturalcapital.finance/en/explore) but it is likely that low to moderate materiality impacts exist in its value chain (especially maritime transport).
Opportunities for improvement	• As metrics and approaches to cover impacts on species extinction and genes mature, Schneider Electric will seek to integrate that data into its biodiversity strategy. Locally, sites can use IBAT tool to gain knowledge on protected areas and species close by. Furthermore, as the GBS evolves, future evaluations will be more complete.

Rigor	
Strengths	• The robustness and transparency of the tool are reinforced by an external GBS critical review committee. Two panels were set up to conduct "critical review" of the GBS in 2020 (the review was completed in early 2020). Their goals were complementary. The expert panel verified the consistency and quality of the tool (assumptions, data, uncertainty, etc.), suggested improvements and assisted in the testing of the software component of the GBS. The stakeholder panel assessed the consistency of the GBS tool with existing public policies related to corporate biodiversity and with existing tools. The experts panel includes half a dozen international scientific experts among which are members of the World Conservation Monitoring Centre (UNEP-WCMC), the French Geological Survey (BRGM), the Food and agricultural Organisation (FAO), the French National Institute of Agricultural Research (INRA), and Senckenberg Biodiversity and Climate Research Centre in Germany. The stakeholders panel is constituted of entities from NGOs, platforms and institutions playing a key role in the post-2020 biodiversity framework and international corporate biodiversity discussions. They include the Directorate-General Environment of the European Commission, EY, the WWF, the Foreign Economic Cooperation Office (FECO) of the Chinese Ministry of Ecology and Environment, the International Union for Conservation of Nature (IUCN), the CBD, the Natural Capital Coalition, the International Finance Corporation (IFC) and Finance for Tomorrow. • The quality of impact factors associated to data inputs is explicitly flagged in input files through a data quality tier system. • Furthermore, companies may seek auditors to provide quality checks on their 'biodiversity footprint assessment', and CDC Biodiversité thus plans to introduce a "GBS verified" service in 2021 or later to provide such quality assurance with partner auditors.
Limitations	• Uncertainties in the assessment of impacts are higher for freshwater (or aquatic) biodiversity than for terrestrial biodiversity and the freshwater impact assessment should thus be considered more as a compass, pointing at the direction to follow to reduce impacts.
Opportunities for improvement	• This first end to end evaluation allowed CDC Biodiversité to see where improvement in the tool should be made and for Schneider Electric, where more precise data should be gathered. For example, the user friendliness of the input files has been improved since the evaluation, but also the graphical outputs such as the greenlight system is a need that has been identified during the evaluation with Schneider Electric.
Replicability	
Strengths	• The GBS and its underlying assumptions are transparent (publication of 11 technical reports explaining how impact factors are built, each report having been externally reviewed) and the impact factor used for each data input has been transparently displayed to Scheider Electric. A technical note for the assessment has also been drafted.
Limitations	• Even if the impact factors (MSA.m2/t) are clearly visible to users in the tool, tracing calculations is not yet available without expert use of the GBS (involving code knowledge). Tracing of calculations (like seeing equations in Excel) will be available to non-expert in the future.
Opportunities for improvement	• The assessment has been an opportunity to highlight the need to display the impact factors used to calculate impacts: an Excel file has been produced and future developments will mean this information is routinely displayed for all assessments.

Aggregation	
Strengths	• Data are available at different geographical or organisational level. After processing by the GBS, impacts expressed in MSA.km² are obtained at the same level. They are then aggregated at the corporate level. Aggregation is at the core of the GBS.
Limitations	
Opportunities for improvement	
Communication	
Strengths	• The MSA measures biodiversity intactness relative to its abundance in undisturbed ecosystems. A 100% ratio indicates an intact ecosystem while damages caused by an increase of pressures brings the MSA progressively to 0% when all originally occurring species are extinct in the ecosystem. The gradual deterioration from a pristine ecosystem to a completely artificialized space is • easily understandable for non experts.
Limitations	• MSA.km² is not yet widespread
Opportunities for improvement	• MSA.km² can help track progress with the "ecosystem integrity" target of the current CBD Zero draft. The dynamic impacts for instance equates the changes in the "Bending the curve" or the no net loss, +5% or +20% ecosystem integrity in the CBD Zero Draft.
User friendliness	
Strengths	• The GBS works with data currently available for companies (but with accuracy in line with the quality of the data inputs) and the outputs met the needs of Schneider Electric. Furthermore, a dozen of consultancies are already trained to use the tool and able to help companies. There is also a clear framework and support ecosystem with CDC Biodiversité.
Limitations	• 3 days of training are needed for evaluators, 1 day for users. R and RStudio are needed to be able to calculate with the GBS (for the evaluator not for the user), but no R knowledge is needed. Application of the GBS usually requires support by consultant. The user interface is currently relatively simple.
Opportunities for improvement	• The user interface can be refined.
Investment	
Strengths	• It is very compatible and in synergy with the carbon balance, water balance, etc. approaches. already engaged by companies. The data required is mostly already available in existing • reporting and environmental declarations.
Limitations	• The assessment required about 40-80 mandays from the consultants (CDC Biodiversité and PRé) and about as much from Schneider Electric.
Opportunities for improvement	

Overall assessment

This case study constitutes the core business application of the GBS.

Overall, the GBS has achieved what it promised to do: quantify the global and end-to-end biodiversity footprint of a large corporation. By providing relevant metrics, the GBS has proven its ability to provide a guide for companies to define meaningful biodiversity strategies.

Case study description and self-assessment carried out by

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More information on the measurement approach can be found here:

2019 technical update: http://www.mission-economie-biodiversite.com/wp-content/uploads/2020/09/N15-TRAVAUX-DU-CLUB-B4B-GBS-UK-MD-WEB.pdf
2018 technical update: http://www.mission-economie-biodiversite.com/wp-content/uploads/2019/05/N14-TRAVAUX-DU-CLUB-B4B-GBS-UK-WEB.pdf
GBS technical update 2017: http://www.mission-economie-biodiversite.com/downloads/biodiv2050-outlook-no-11/