Briefing paper

Top 10 biodiversity-impact ranking of company industries

A pilot analysis applying four biodiversity-impact assessment tools provides biodiversity footprint scores of high-impact sectors and industries

The Finance for Biodiversity (FfB) Foundation is supporting a call to action and collaboration among financial institutions to reverse nature loss in this decade and ensure ecosystem resilience. It currently has 126 signatories globally, with EUR18.8trn of assets under management, who have signed a pledge to collaborate and share knowledge, engage with companies, assess impact, set targets and report publicly on the year 2024 at the latest.[1]

This briefing paper is summarising a pilot study led by the FfB Foundation. The study covers a collaboration of four frontier biodiversity footprint tools[2] and includes input from UNEP-WCMC, which represents the ENCORE partners[3]. It identifies companies and sectors with a high potential impact on biodiversity and aims to leverage the results for company engagement.

Executive Summary

- The food, beverage and tobacco sector has the highest potential impact on biodiversity of all identified sectors, followed by the materials sector.
- The industry within the sectors with the highest potential negative impact on biodiversity is food products.
- The sector analysis is based on a list of 250 high-impact companies, using a multi-tool collaboration of four bio-diversity footprint tools as well as a sector tool as a reference.
- The list of the top 250 high-impact companies is based on the MSCI World Index and responsible for 73% of the estimated biodiversity impact of the index.
- The pilot analysis assessed potential impacts rather than actual impacts as corporate data is lacking.
- The multi-tool analysis was a pilot as part of preparatory work for the global investor engagement initiative Nature Action 100 (NA100) and funded by the Accountability Accelerator, an initiative which seeks to ensure that corporations are delivering on their nature commitments.
- The FfB Foundation, an international investor-led coalition and co-lead of the Technical Advisory Group (TAG) of NA100, led the pilot and partnered with Globalbalance, a UK environmental consultancy firm.
  Advisors to the pilot were consulting company Arcadis and the Partnership for Biodiversity Accounting Financials (PBAF).

[1] Signatories commit to report about the year 2024 from 2025 at the latest. Please find more information about the Finance for Biodiversity Pledge here.

[2] The four footprinting tools which collaborated are BIA-GBS, BFFI, CBF and GID. Characteristics on the tools are described in the Guide on biodiversity measurement approaches.

[3] ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a tool which was developed by Global Canopy, UNEP Finance Initiative and UNEP-WCMC.

High impact food and beverage sector

The potential impact of the food, beverage and tobacco sector on biodiversity is highest (calculated based on 250 listed companies of the MSCI World Index) in a ranking of top 10 sectors and exceeds the impact of the materials sector, an analysis using frontier tools has shown (see figures 1 and 2 below).

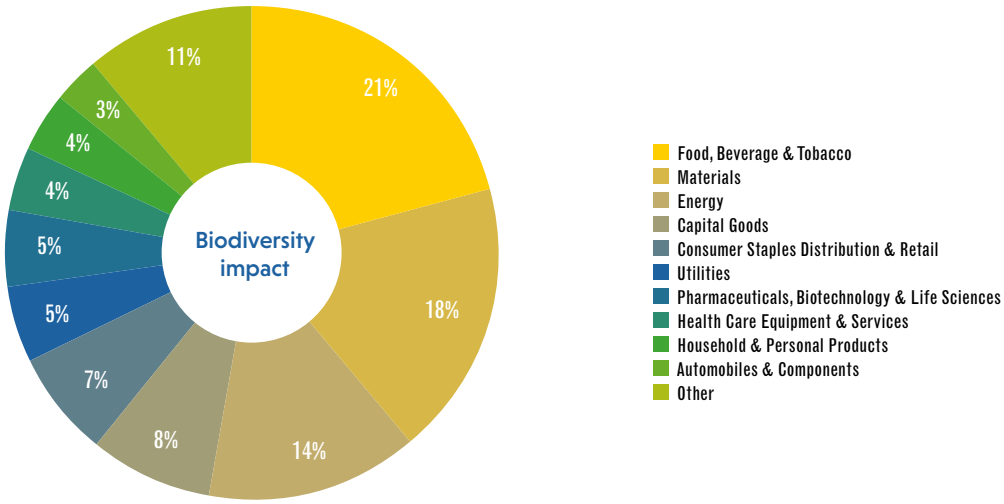

Figure 1: Biodiversity impact (calculated as the sum of normalised average impact scores) of the companies in the top 250 list, split out by GICS industry groups.

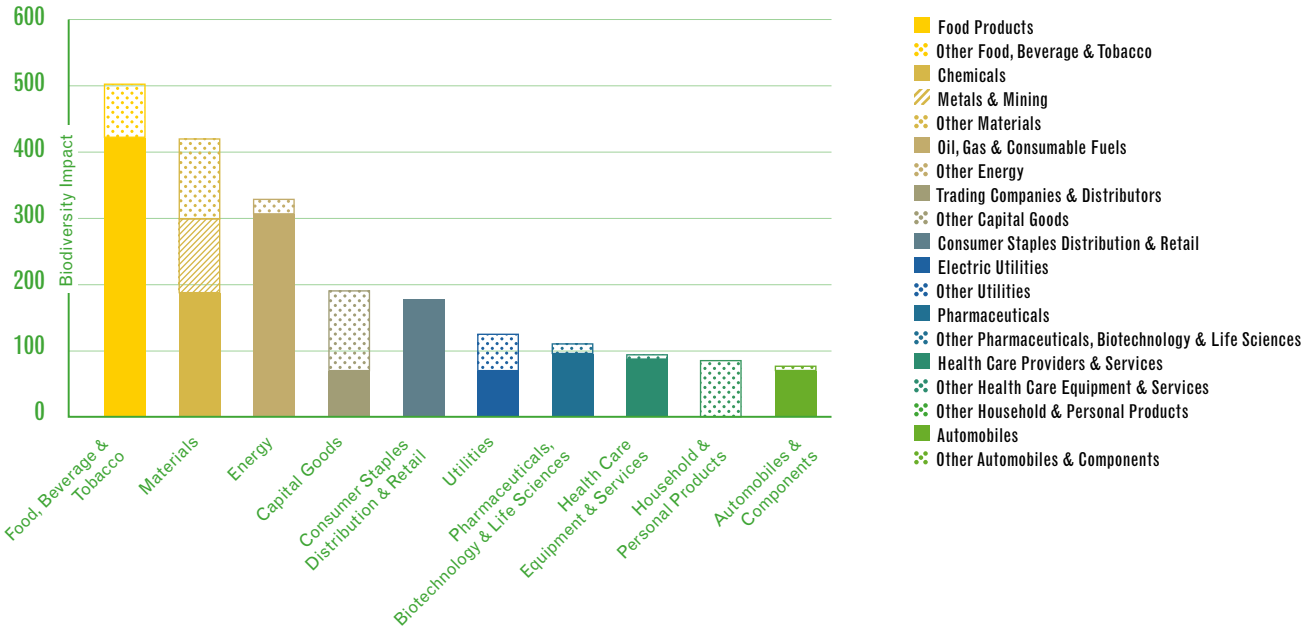

Figure 2: Biodiversity impact (calculated as the sum of normalised average impact scores) of the companies in the top 250 list, split out by GICS industry groups and GICS industries.

The top three out of 10 high-impact industries are food products, oil, gas & consumable fuels and chemicals (see table 1). The analysis shows that biodiversity impact involves a variety of sectors and industries beyond well-known climate risk sectors, such as extractives and minerals.

The top 10 high-impact industries based on the percentage of their average normalised impact scores for the top 250 high-impact companies are listed below.

Table 1: Top 10 industry ranking based on percentage of average normalised impact scores for the top 250 companies analysed.

	GICS Industry - L3	Number of companies per industry	Sum of average normalised impact per industry	% of average normalised impact per industry
1	Food Products	20	421	18%
2	Oil, Gas & Consumable Fuels	24	307	13%
3	Chemicals	20	187	8%
4	Consumer Staples Distribution & Retail	17	176	7%
5	Metals & Mining	13	110	5%
6	Pharmaceuticals	12	95	4%
7	Health Care Providers & Services	5	86	4%
8	Automobiles	7	69	3%
9	Electric Utilities	12	68	3%
10	Trading Companies & Distributors	5	68	3%
	Other	115	798	34%

The analysis is advancing the current state of biodiversity impact research as it helps establishing a common ground between the tool providers. The multi-tool pilot combines relatively mature biodiversity footprinting approaches currently available for portfolio assessment and various ways of assessing impact on biodiversity in one result.

The developed methodology was a pilot as part of preparatory work for NA100.

"What's really interesting is that a relatively small number of companies are responsible for this impact – this means that focused engagement by investors based on these results could drive real, positive change for biodiversity."
- Annelisa Grigg, Director and Sustainability Advisor at Globalbalance

Multi-tool collaboration of footprinting tools

The analysis identified the sectors and industries with the highest potential negative biodiversity impact using a ranking of 250 companies, which was created based on the MSCI World Index[4] as the initial universe.

The pilot was led by the FfB Foundation, which partnered with Annelisa Grigg, Director and Sustainability Advisor at Globalbalance. Further advisors of the study were consulting company Arcadis and the PBAF.

To generate the biodiversity impact ranking, the partners coordinated a multi-tool collaboration[5] of four biodiversity footprint tools.

[4] The MSCI World Index was used as the company universe, as it is a leading benchmark for many investors. The index captures large and mid-cap companies across 23 developed markets with 1,564 constituents. Thus, companies not listed in the MSCI World Index are not included in the analysis. Additionally, the finance sector was excluded, as not all tools cover financial institutions, and as the analysis has a specific corporate focus. The study was done for the financial year ending 31 December 2020.

[5] More information on each tool can be found in the 2022 Guide on biodiversity measurement approaches by the FfB Foundation and the European Commission Business & Biodiversity Platform.

This included the BIA-GBS tool, which is co-owned by Carbon4 Finance and CDC Biodiversité, a subsidiary of Caisse des Depots; the CBF tool, which was developed by Iceberg Data Lab in cooperation with I Care; the BFFI tool, developed by Dutch ASN Bank, Dutch consultancies PRé Sustainability and CREM; and the GID tool, which builds on natural capital methodologies by True Price, a Dutch NGO, and was developed in collaboration with Wageningen Economic Research. Additionally, the sector tool ENCORE was applied to verify the results.

"Biodiversity footprinting is a new approach for investors, and contributes to raising awareness about the main drivers of biodiversity loss. This plural approach [of the multi-tool study] contributed to avoiding any blind spots in the selection of the companies having the most impact on biodiversity throughout their value chain."
- Matthieu Maurin, CEO of Iceberg Data Lab

Methodology

The ranking of the industries and sectors was compiled by:

- Harmonising ISIN codes and addressing some data gaps;[6]
- Averaging the normalised impact scores of the different tools;[7]
- Developing a top 250 list of companies with the highest potential negative impact on biodiversity by adding up the results of the top companies by each tool provider[8], rather than using an average between the tools;
- Carrying out a quality check on the top 150 of the identified 250 companies to identify and review outliers of each tool;[9]
- Adding SICS and GICS industry and thematic sector codes to the results (please see table 2 and 3 in annex 1 and 2); and
- Calculating the final percentage for all companies of the top 250 list for each thematic sector and industry.

"Biodiversity footprinting tools quantify the biodiversity impact of the companies in the index. The scope includes direct, and supply chain resource use and emissions. Biodiversity impact is calculated using impact assessment models. The results can be used to find hotspots in the portfolio and get an overview of the main drivers of biodiversity loss."
- Daniel Kan, Sustainability Consultant at PRé Sustainability

[6] Some companies had the same ISIN codes for different equity issuances; where this was the case, the records were merged after checking the codes at the relevant stock exchange; where data gaps could not be addressed (i.e., some companies are not covered by all tools), missing impact results were treated as having zero impact when calculating the normalised impact scores. Some tools held no data for companies which were identified as potentially having a large biodiversity footprint by other tools. These companies were retained within the list.

[7] The calculation of the normalised impact scores (scale 0-100) for each company was done separately for each tool to enable cross-tool comparison. (Calculation: Normalised impact score of company X = (Impact score of company X / impact score of company ranked #1)*100.) The calculation of the average normalised impact score for each company is based on its normalised impact scores for the different tools.

[8] From each tool provider the top 117 companies were combined in the final list of 250 companies. The underlying revenue data sets boundaries on assessment and impact calculation models, and different metrics are used across the tools. As a result, there is a variation in the ranking of companies across the tools. The approach builds on the diversity of the methods underpinning the tools, allowing topics and companies which may be overlooked by one tool to be included based on the results of another tool.

[9] The following quality check was carried out on the top 150 list of companies, which was created based on the top 63 companies of each tool: Companies within the top 63 of one tool which ranked lower than 100 by all other tools (for companies with a combined ranking of 1-100) or lower than 150 by all other tools (for companies with a combined ranking of 100-150) were flagged as potential outliers. These companies were reviewed by the tool providers. For most companies, the results were confirmed. Two companies were identified as outliers by the tool providers. Outlier data (impact data for the specific company and tool) was taken out of the analysis, leading to these two companies being taken out of the top 150 list.

Top 250 high-impact companies represent 73% of MSCI World Index footprint

For each tool, a comparatively small number of companies is responsible for a significant proportion of the potential biodiversity footprint.[10] Out of 1,564 companies of the MSCI World Index, the top 250 high-impact companies cover over 70% of negative potential impact on biodiversity of the index (see figure 3 below).

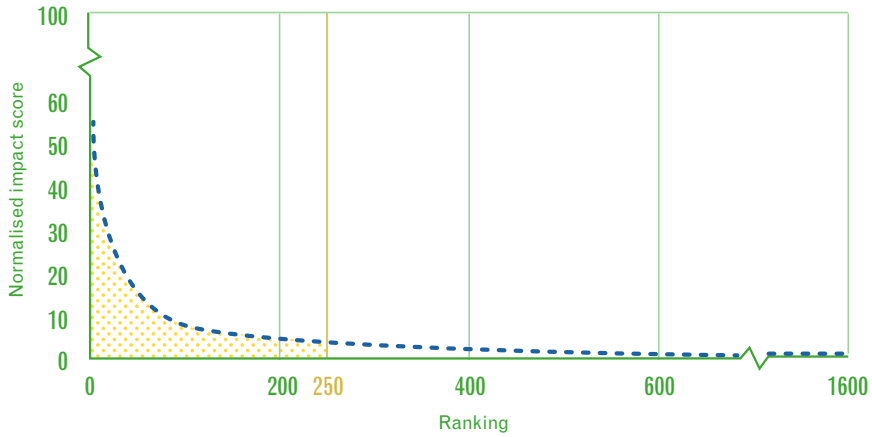

Figure 3: Average normalised impact score (for all four tools combined) plotted against company ranking.

Considerations

The results of the multi-tool study need to be interpreted in context of certain limitations.

- The analysis assesses potential impact rather than actual impact: The calculations are largely based on a combination of revenue figures, product footprints (regarding drivers of loss) and sector averages, as corporate disclosures on land use change, emissions, resource use etc. is insufficient.
- North American and European companies dominate the MSCI World Index, which means the data is limited in relation to its geographical coverage.
- The study covers only listed companies.
- The revenue data used as a basis for calculation varied across the different tools. In addition, the footprint tools showed differences in how scopes (i.e. scope 1, 2, 3 emissions) and pressures were addressed.[11]
- Due to data gaps in the underlying models drawn upon by the tools, the impacts of the following sectors on biodiversity may be understated: marine (shipping, aquaculture, fisheries etc.), construction, chemicals, agriculture and transportation.
- Furthermore, the agriculture sector is underrepresented in the MSCI World Index, although the inclusion of scope 3 emission impacts for some sectors in some of the tools addresses this point to some extent.

"The combination of the four tools is an innovative exercise that makes it possible to limit the known biases of existing tools, such as the lack of coverage of marine ecosystems or certain sectoral biases. These initial results thus provide crucial information to investors on the priority sectors for biodiversity."
- Violette Pradere, Project Manager at CDC Biodiversite

"Currently companies are not widely reporting biodiversity-related data, so models using revenues and sector averages are required. These models provide a high-level understanding of the main biodiversity drivers in a portfolio such as the MSCI World Index. The results provide an approach which narrows the focus to the areas of highest importance. We have recently seen improvements in the amount of company reported biodiversity data. However, it will take time for all companies to report, so revenue and sector models will be needed to fill data gaps in the interim."
- Toby Smith, Manager at Impact Institute

[10] This justifies the approach to focus on the top-ranked companies by different tools to identify high-impact sectors and industries.

[11] The tools underrepresent impacts on the marine environment and do not include impacts of alien invasive species. Furthermore, some tools do not include resource exploitation (including water use). Downstream value chain impacts (scope 3) are not fully covered by all tools. Details on what is included in each tool is captured in the Guide on biodiversity measurement approaches (tables 2 and 3).

Conclusion

The multi-tool pilot analysis has led to insights about which industries are key for engagement on biodiversity impact. Analysing companies with footprinting tools provides a deeper understanding on how the footprints of different industries, including their drivers of loss, compare to each other. On the other hand, it must be considered that sample companies of the MSCI World Index are only used as proxies for industry footprints and cannot be fully representative for these. To be more representative, the geographic representation of the companies analysed needs to be extended to also include emerging markets, unlisted companies and underrepresented sectors such as agriculture.

The results of the study – combining four different footprinting tool measurements and comparing these to the ENCORE tool – help investors in their portfolio assessments and engagement decision making. We advise that similar studies are undertaken to address the limitations highlighted in this analysis, inform engagement and at the same time contribute to further understanding and improvement of the footprinting tools.

Next steps and other possible applications

Going forward, the FfB Foundation plans to continue its collaboration with the tool providers of this study. The aim of the next multi-tool study is to provide company information, including details on the main drivers of loss as well as dependencies assessments. Additionally, updated company data and advanced methodologies e.g. on dependencies are planned to be used.

This briefing paper supplements previous publications by the FfB Foundation and the European Business & Biodiversity Platform, including the 2022 Guide on engagement with companies as well as the 2022 Guide on biodiversity measurement approaches.

The FfB Foundation will continue to provide investors with the literature and levers needed to drive positive action on biodiversity.

This briefing paper has been developed by the FfB Foundation as part of preparatory work to identify high-impact companies on biodiversity for the NA100 initiative.

The pilot study was led by Annelisa Grigg (Globalbalance), Anne-Marie Bor and Iris Hertog (FfB Foundation). Advisors of the study were Arcadis and the Partnership for Biodiversity Accounting Financials (PBAF). Among others involved were Mark Wildschut (Wildcap).
The briefing paper was compiled by Elena Johansson (FfB Foundation) and Anne-Marie Bor (FfB Foundation).

We would like to thank everybody who contributed to the multitool analysis and this position paper, especially the representatives of the BIA-GBS, BFFI, CBF, GID and ENCORE tools and Liudmila Strakadonskaya (AXA IM), co-chair of the FfB Foundation Impact Assessment working group. We are grateful for the funding provided to run this multi-tool study by the Global Commons Alliance's Accountability Accelerator funded by Porticus.

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Annex 1 - Results in GICS (1/2)

Table 2: Biodiversity impact (calculated as the sum of normalised average impact scores) of companies in the top 250 list, split out by GICS Industry Groups and Industries.

	Biodiversity impact (sum of average normalised impact scores)			Number of companies within top 250 list	
GICS Industry Groups and Industries	Absolute impact	% of total	Industry ranking (1-50)	Absolute number	% of total
Food, Beverage & Tobacco	**505**	**21%**		**31**	**12%**
Food Products	421	18%	1	20	8%
Beverages	64	3%	11	8	3%
Tobacco	20	1%	25	3	1%
Materials	**421**	**18%**		**46**	**18%**
Chemicals	187	8%	3	20	8%
Metals & Mining	110	5%	5	13	5%
Paper & Forest Products	58	2%	12	6	2%
Containers & Packaging	50	2%	13	5	2%
Construction Materials	16	1%	30	2	1%
Energy	**332**	**14%**		**27**	**11%**
Oil, Gas & Consumable Fuels	307	13%	2	24	10%
Energy Equipment & Services	25	1%	23	3	1%
Capital Goods	**192**	**8%**		**30**	**12%**
Trading Companies & Distributors	68	3%	10	5	2%
Industrial Conglomerates	34	1%	18	5	2%
Machinery	33	1%	19	7	3%
Building Products	20	1%	26	5	2%
Aerospace & Defense	16	1%	31	3	1%
Construction & Engineering	12	0%	35	3	1%
Electrical Equipment	11	0%	36	2	1%
Consumer Staples Distribution & Retail	**176**	**7%**		**17**	**7%**
Consumer Staples Distribution & Retail	176	7%	4	17	7%
Utilities	**125**	**5%**		**21**	**8%**
Electric Utilities	68	3%	9	12	5%
Multi-Utilities	29	1%	20	5	2%
Independent Power and Renewable Electricity Producers	28	1%	22	4	2%
Pharmaceuticals, Biotechnology & Life Sciences	**111**	**5%**		**15**	**6%**
Pharmaceuticals	95	4%	6	12	5%
Biotechnology	17	1%	29	3	1%
Health Care Equipment & Services	**94**	**4%**		**7**	**3%**
Health Care Providers & Services	86	4%	7	5	2%
Health Care Equipment & Supplies	8	0%	2	2	1%
Household & Personal Products	**86**	**4%**		**7**	**3%**
Household Products	46	2%	14	5	2%
Personal Care Products	39	2%	16	2	1%
Automobiles & Components	**74**	**3%**		**8**	**3%**
Automobiles	69	3%	8	7	3%
Automobile Components	5	0%	41	1	0%

Annex 1 - Results in GICS (2/2)

	Biodiversity impact (sum of average normalised impact scores)			Number of companies within top 250 list	
GICS Industry Groups and Industries	Absolute impact	% of total	Industry ranking (1-50)	Absolute number	% of total
Consumer Discretionary Distribution & Retail	**64**	**3%**		**6**	**2%**
Broadline Retail	39	2%	17	2	1%
Specialty Retail	25	1%	24	4	2%
Consumer Services	**45**	**2%**		**6**	**2%**
Hotels, Restaurants & Leisure	45	2%	15	6	2%
Transportation	**36**	**1%**		**7**	**3%**
Marine Transportation	17	1%	28	2	1%
Air Freight & Logistics	15	1%	32	4	2%
Ground Transportation	3	0%	45	1	0%
Technology Hardware & Equipment	**30**	**1%**		**4**	**2%**
Technology Hardware, Storage & Peripherals	29	1%	21	3	1%
Electronic Equipment, Instruments & Components	1	0%	50	1	0%
Media & Entertainment	**24**	**1%**		**4**	**2%**
Interactive Media & Services	17	1%	27	2	1%
Media	4	0%	43	1	0%
Entertainment	3	0%	47	1	0%
Consumer Durables & Apparel	**23**	**1%**		**5**	**2%**
Textiles, Apparel & Luxury Goods	14	1%	33	3	1%
Household Durables	9	0%	37	2	1%
Telecommunication Services	**15**	**1%**		**3**	**1%**
Diversified Telecommunication Services	13	1%	34	2	1%
Wireless Telecommunication Services	3	0%	48	1	0%
Software & Services	**11**	**0%**		**2**	**1%**
Software	8	0%	39	1	0%
IT Services	4	0%	44	1	0%
Equity Real Estate Investment Trusts (REITs)	**11**	**0%**		**2**	**1%**
Specialized REITs	8	0%	38	1	0%
Diversified REITs	3	0%	49	1	0%
Semiconductors & Semiconductor Equipment	**5**	**0%**		**1**	**0%**
Semiconductors & Semiconductor Equipment	5	0%	42	1	0%
Real Estate Management & Development	**3**	**0%**		**1**	**0%**
Real Estate Management & Development	3	0%	46	1	0%
Real Estate Management & Development	3	0%	46	1	0%
Total	**2384**	**100%**		**250**	**100%**

Annex 2 – Results in SICS (1/2)

Table 3: Biodiversity impact (calculated as the sum of normalised average impact scores) of companies in the top 250 list, split out by SICS Thematic Sectors and Industries.

	Biodiversity impact (sum of average normalised impact scores)			Number of companies within top 250 list	
SICS Thematic Sectors and Industries	Absolute impact	% of total	Industry ranking (1-50)	Absolute number	% of total
FB (Food & Beverage)	**711**	**30%**		**51**	**20%**
Processed Foods	227	10%	2	15	6%
Food Retailers & Distributors	130	5%	5	14	6%
Agricultural Products	126	5%	6	3	1%
Meat, Poultry & Dairy	103	4%	9	3	1%
Non-Alcoholic Beverages	44	2%	17	5	2%
Restaurants	36	2%	20	4	2%
Alcoholic Beverages	24	1%	25	4	2%
Tobacco	20	1%	28	3	1%
EM (Extractives & Minerals Processing)	**437**	**18%**		**40**	**16%**
Oil & Gas – Exploration & Production	232	10%	1	16	6%
Metals & Mining	102	4%	10	11	4%
Oil & Gas – Refining & Marketing	32	1%	22	4	2%
Oil & Gas – Services	25	1%	23	3	1%
Construction Materials	24	1%	24	3	1%
Iron & Steel Producers	21	1%	27	3	1%
RT (Resource Transformation)	**334**	**14%**		**44**	**18%**
Chemicals	190	8%	3	21	8%
Containers & Packaging	59	2%	12	6	2%
Electrical & Electronic Equipment	46	2%	15	9	4%
Industrial Machinery & Goods	21	1%	26	4	2%
Aerospace & Defense	18	1%	30	4	2%
CG (Consumer goods)	**228**	**10%**		**23**	**9%**
Multiline and Specialty Retailers & Distributors	119	5%	7	11	4%
Household & Personal Products	52	2%	14	6	2%
E-Commerce	35	1%	21	1	0%
Apparel, Accessories & Footwear	14	1%	34	3	1%
Building Products & Furnishings	4	0%	42	1	0%
Appliance Manufacturing	3	0%	47	1	0%
HC (Health Care)	**221**	**9%**		**24**	**10%**
Biotechnology & Pharmaceuticals	111	5%	8	15	6%
Health Care Distributors	58	2%	13	3	1%
Drug Retailers	40	2%	19	3	1%
Medical Equipment & Supplies	8	0%	39	2	1%
Managed Care	4	0%	43	1	0%

Annex 2 – Results in SICS (2/2)

	Biodiversity impact (sum of average normalised impact scores)			Number of companies within top 250 list	
SICS Thematic Sectors and Industries	Absolute impact	% of total	Industry ranking (1-50)	Absolute number	% of total
IF (Infrastructure)	**184**	**8%**		**30**	**12%**
Electric Utilities & Power Generators	163	7%	4	24	10%
Engineering & Construction Services	12	0%	35	3	1%
Real Estate	6	0%	40	2	1%
Water Utilities & Services	4	0%	44	1	0%
TR (Transportation)	**118**	**5%**		**17**	**7%**
Automobile	69	3%	11	7	3%
Marine Transportation	17	1%	32	2	1%
Air Freight & Logistics	15	1%	33	4	2%
Auto Parts	10	0%	37	2	1%
Cruise Line	3	0%	45	1	0%
Rail Transportation	3	0%	46	1	0%
TC (Technology & Communications)	**95**	**4%**		**15**	**6%**
Hardware	42	2%	18	6	2%
Telecommunication Services	20	1%	29	4	2%
Internet Media & Services	17	1%	31	2	1%
Software & IT Services	11	0%	36	2	1%
Semiconductors	5	0%	41	1	0%
RR (Renewable Resources & Alternative Energy)	**53**	**2%**		**5**	**2%**
Pulp & Paper Products	45	2%	16	4	2%
Forestry Management	8	0%	38	1	0%
SV (Services)	**3**	**0%**		**1**	**0%**
Media & Entertainment	3	0%	48	1	0%
Total	**2384**	**100%**		**250**	**100%**