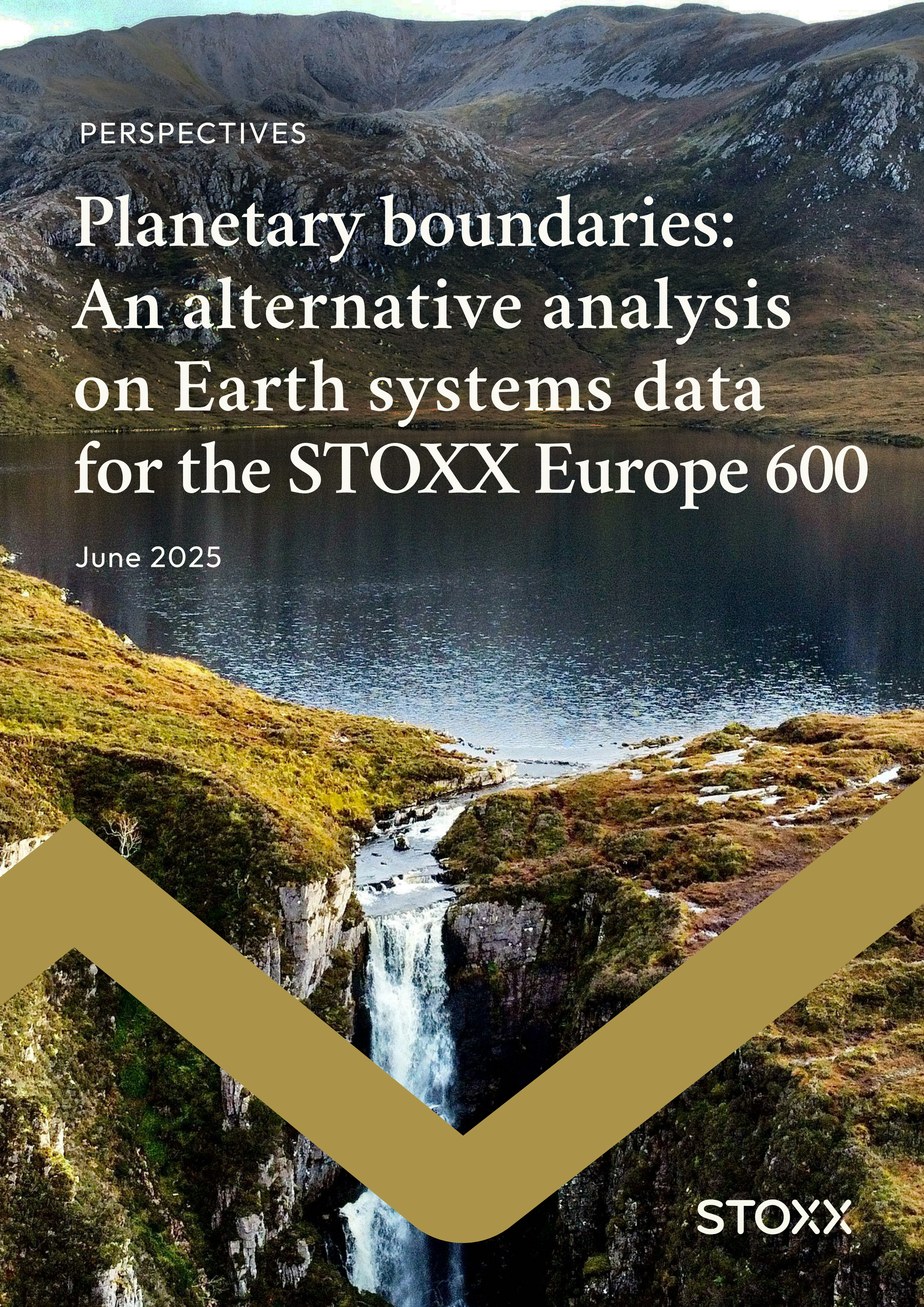


PERSPECTIVES

Planetary boundaries: An alternative analysis on Earth systems data for the STOXX Europe 600

June 2025

STOXX

Planetary boundaries: An alternative analysis on Earth systems data for the STOXX Europe 600

Far from slowing, concerns about climate change and nature loss continue to grow for investors in 2025. These issues are inextricably linked, often compounding one another to create environmental challenges and portfolio risks.

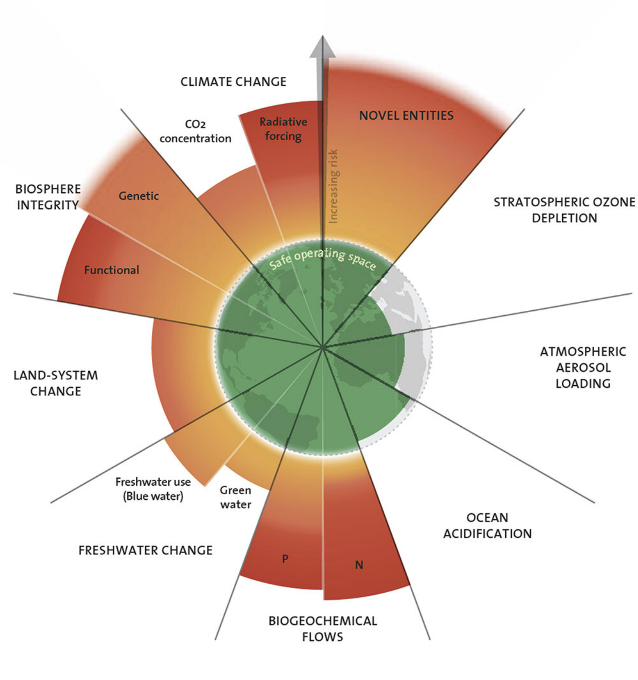
To understand the complex interplay of climate and nature, and minimize the risk of irreparable damage, a holistic approach is needed.

One such approach is the Planetary Boundaries Framework (PBF). Proposed by Professor Johan Rockström and a group of 28 scientists in 2009, the PBF represents a novel and expansive way to conceptualize the ecological limits to preserve Earth's viability.[1] The framework outlines nine critical Earth system boundaries (Figure 1) that provide a "safe operating space for humanity." Each boundary is assigned zones of safe, increasing and high risk, with tipping points that lead to irreversible change.

An analysis of PBF-related metrics could help investors unlock the value of data to manage portfolio risk, guide stewardship and strengthen system-level resilience. Ideally, investors could gain a better understanding of their portfolio's exposures by adopting a more systematic approach in line with the PBF, one that could show whether an investee company is operating within safe ecological boundaries or, on the contrary, is contributing to transgressing them.

However, translating the PBF from a global perspective to a single-business level is not always possible, says Clarissa Persico, Freshwater and Oceans Lead, Natural Capital Research Institute (NCRI) at ISS STOXX. As the PBF is a scientific framework that assesses human activities' impact on a global scale, the units of calculation and factors for each of the nine boundaries cannot always be downscaled at asset level, she explains.[2]

Figure 1: Planetary Boundaries Framework (PBF)



Source: Azote for Stockholm Resilience Centre, based on analysis in Richardson et al. (2023).

An alternative analysis

One other approach would be to adopt alternative indicators to gain a better understanding of a company's position towards certain processes that regulate the stability and resilience of Earth's systems, Clarissa says.

In this report, we look at some such indicators provided by ISS STOXX's ESG Corporate Rating, and apply them to the STOXX® Europe 600. The exercise is aimed

[1] Nature, 'A safe operating space for humanity,' September 23, 2009.

[2] For more on the alternative approach, visit ISS ESG, "Actionable Insights: Top ESG Themes in 2025: Overview," January 21, 2025.

at showing what type of data and analysis are at hand for investors with regards to climate and nature aspects, as well as provide an introductory overview of the current situation for a typical holding of European equities.

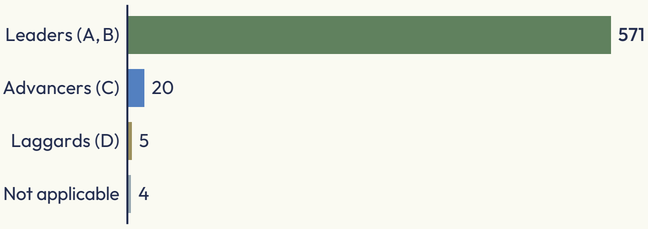
Climate change

The first set of indicators addresses climate change and focuses on greenhouse gas (GHG) emissions – an area where regulation and investor engagement have driven widespread corporate disclosure. Climate change remains a top priority for stakeholders ranging from investors to policymakers, as global warming directly affects all systems that regulate the Earth. As emissions rules become more stringent, climate-related financial risks continue to rise.

Figure 2 shows grades on *GHG emissions inventories* practices from STOXX Europe 600 constituents. This indicator evaluates a company's data collection regarding its emissions. As shown, this is an area of nearly full disclosure among Europe's largest companies, with 96% of index constituents categorized as Leaders in the field.

The ISS ESG solution's scale assigns a company grade that ranges from A (very comprehensive strategy) to D (very limited/no publicly evident strategy). Leaders are A to B, while Advancers are C and Laggards are D.

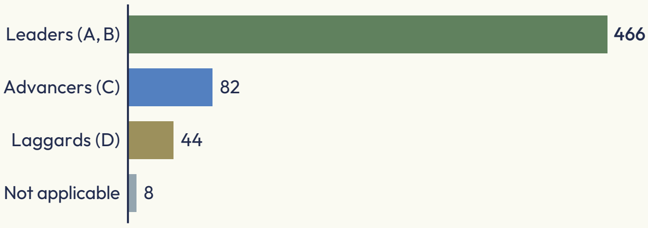
Figure 2: STOXX Europe 600 leaderboard – Indicator: GHG emissions inventories



Source: ISS STOXX's ESG Corporate Rating, May 2025.
'Not applicable': the factor is considered irrelevant for the company (i.e., due to its specific product portfolio or its size) while it is generally considered relevant for the industry. For illustrative purposes, the figure simplifies the outputs of ESG Corporate Rating's data. More granular and detailed scores are available.

A second indicator is the existence and quality of a company's *GHG emissions reduction targets* and measures or *action plans* to achieve them. 78% of companies in the index are considered Leaders by ISS STOXX and a further 14% rated Advancers.

Figure 3: STOXX Europe 600 leaderboard – Indicator: GHG targets and actions plans



Source: ISS STOXX's ESG Corporate Rating, May 2025.

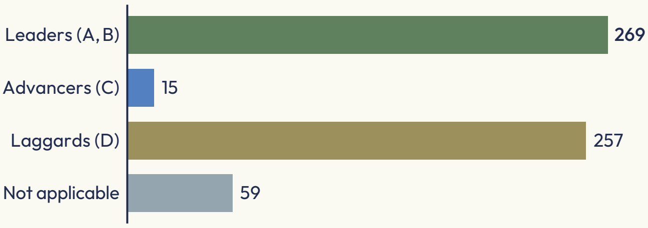
Freshwater change

Unsustainable freshwater use leads to natural resources depletion while also contributing to the disruption of ecosystems. This is an area of high operational risk, particularly for water-intensive industries, as regulatory fines have increased and reports of resource shortages have become common.

To calculate freshwater use in the PBF, blue and green water use metrics are adopted. While direct metrics to evaluate these two factors at asset level are impaired by the lack of data disclosure, there are, again, alternative indicators such as *Freshwater use intensity* and *Freshwater inventories* that can shed light on companies' risk exposure in relation to water.

Data in these fields is less widespread than GHG emissions but still provides a useful snapshot and some company specificity. ESG Corporate Rating's *Freshwater use intensity* indicator evaluates a company's freshwater withdrawal or consumption efficiency. Here, data show that 43% of index constituents are Laggards, a higher number than seen in climate change indicators.

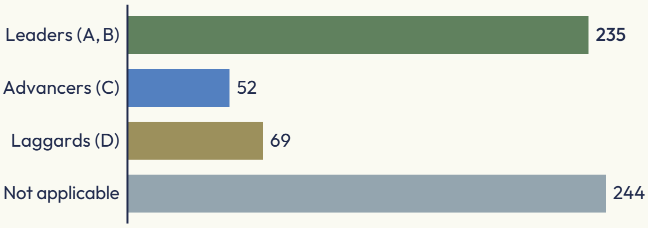
Figure 4: STOXX Europe 600 leaderboard – Indicator: Freshwater use intensity



Source: ISS STOXX's ESG Corporate Rating, May 2025.

Turning to *Freshwater inventories*, this metric looks at whether a company discloses information about its freshwater use.

Figure 5: STOXX Europe 600 leaderboard – Indicator: Freshwater inventories



Source: ISS STOXX's ESG Corporate Rating, May 2025.

"By adopting alternative indicators and screening methodologies, investors are able to drive strategic discussions and engagement, with the goal of promoting effective stewardship and supporting a better assessment of systemic investment risks," said Clarissa at NCRI, ISS STOXX. "In assessing and understanding companies' position related to certain aspects of nature and climate, it is possible to analyze a portfolio's risks and also opportunities tied to these boundaries."

According to the NCRI associate, setting targets for companies to reduce their own freshwater use is key to effective stewardship and can drive companies to implement more sustainable strategies. Her analysis shows that 100% of companies under ISS ESG coverage that have a comprehensive target or action plans in place have decreased their freshwater use intensity. That compares with only 37% of companies without such plans.[3]

Land system change – Industry case

Land system change is another critical planetary boundary. It is also a major driver of biodiversity loss and global warming.

Deforestation is a central concern in this context. The EU Deforestation-free Regulation (EUDR) is expected to come into effect at the end of December for large and medium-sized enterprises. The regulation imposes strict materials sourcing requirements on companies that market commodities linked to deforestation – such as cocoa, coffee, soy, palm oil, wood, rubber and cattle – and on products made from or involving those commodities, including beef, chocolate and cosmetics.[4]

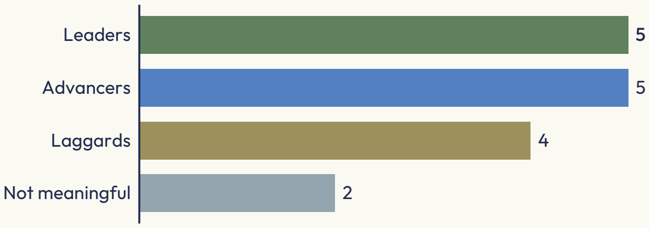
Two indicators can help guide investors in this area: *Measures to prevent deforestation* and *Percentage of commodities certified as deforestation- or conversion-free* (PCCDCF). While a comprehensive, market-wide analysis is currently limited by insufficient reporting, focusing on industries with significant land use – such as food production – can yield more meaningful insights. Many environmental indicators are, by nature, industry-specific.

Within the 16 food product manufacturers in the STOXX Europe 600, ten are either Leaders or Advancers in *Measures to prevent deforestation* (Figure 6).

[3] ISS ESG, 'Actionable Insights: Top ESG Themes in 2025: Overview,' January 21, 2025.

[4] For more information on the EUDR, see IDOS, 'The Current Column, Weakening anti-deforestation regulation threatens EU's credibility.'

Figure 6: STOXX Europe 600 food producers leaderboard – Indicator: Measures to prevent deforestation

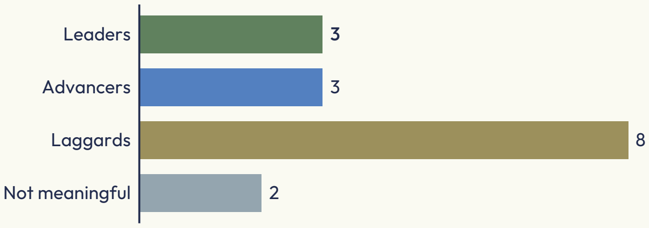


Source: ISS STOXX's ESG Corporate Rating, May 2025.
'Not meaningful': the factor is not part of the company's rating structure. This usually means the factor is considered irrelevant for the industry.

The picture is less positive, however, when screening those same companies for the *Percentage of commodities they employ that are certified as deforestation- or conversion-free* (PCCDCF). Exactly half of the group are categorized as Laggards (Figure 7), usually a populated cohort when considering new or less developed reporting categories.

PCCDCF indicates whether a company publicly discloses that they source commodities that are certified deforestation- or conversion-free.[5] This metric can be a good starting point to evaluate and look at scientific and global targets such as the Science-Based Targets Initiative's Forest, Land and Agriculture Guidance, Andrew Taylor-Kerr, ESG associate at ISS STOXX, wrote in an 'Actionable Insights' report this year.[6]

Figure 7: STOXX Europe 600 food producers leaderboard – Indicator: Percentage of commodities certified as deforestation- or conversion-free



Source: ISS STOXX's ESG Corporate Rating, May 2025.

The role of indices

Climate disclosures are now a standard requirement for investors in many jurisdictions, and nature-related risks are emerging as the next regulatory frontier. The analysis approach proposed in this report considers the nature–climate nexus and its interconnections with ecosystems, enabling a proactive response to environmental liabilities. The data presented earlier can serve as a foundation for strategic discussions aimed at building and protecting portfolios, and it provides a strong starting point for effective stewardship and corporate engagement.

Index-based strategies have evolved in recent years in response to heightened climate and nature regulations. They can integrate the metrics discussed above, offering an effective, systematic and transparent methodology for addressing risks and achieving strategic objectives and policy goals.

Customized sustainability solutions can complement an extensive menu of carbon and nature datasets that are already employed in existing STOXX indices, from the ISS STOXX® Net Zero Transition to the ISS STOXX® Biodiversity suites, to name a couple.

The ISS STOXX Net Zero Transition indices are a next-generation, optimized set focused on net-zero targets, real-world transition-aligned metrics, and encompassing of all industries included in the parent universe. The ISS STOXX Biodiversity indices, for their part, exclude companies involved in activities causing harm to biodiversity, select securities with a less negative impact on ecosystems and those enabling exposure to relevant UN Sustainable Development Goals (SDGs), and, finally, reduce the portfolio's carbon emissions.

The need to better understand the environmental and economic impacts of natural systems – and their implications for investors – is growing. As companies disclose more information and data collection methods evolve, this process is becoming more efficient – and effective as a result.

[5] To achieve the maximum grade, at least 50% of relevant commodity volume must be certified.

[6] ISS ESG, 'Actionable Insights: Top ESG Themes in 2025: Overview,' January 21, 2025.

Offices and contacts

Learn more about STOXX & DAX Indices on STOXX.com

Zug
Theilerstrasse 1A
6300 Zug
Switzerland
P|+41 43 430 71 60

London
1 London Bridge
4th Floor, West Building
London, SE1 9BG
United Kingdom
P|+44 20 7862 7680

Frankfurt
Taunus Tower
Mergenthalerallee 73–75
65760 Eschborn
Germany
P|+49 6196 7719 257

Paris
5 Rue du Renard
75004 Paris
France
P|+33 1 55 27 38 38

Prague
Futurama Business Park Building E
Sokolovska 662/136e
186 00 Prague 8
Czech Republic
P|+420 226 238 419

ISS Inc. (New York)
1177 Avenue of the Americas
14th Floor
New York, NY 10036
USA
P|+1 646 680 6350

Hong Kong
26F, Prosperity Tower
39 Queen's Road Central
Central, Hong Kong
P|+852 3107 8030

ISS Australia Pty. (Sydney)
7F, 55 Clarence St
Sydney, NSW 2000
Australia
P|+61 2 8048 3999

ISS K.K. (Tokyo)
Sumitomo Fudosan Kanda, Building 16F
7 Kanda Mitoshiro-cho, Chiyoda-ku
Tokyo 101-0053
Japan
P|+852 3107 8030

Call a STOXX representative
Customer support
customersupport@stoxx.com
P|+41 43 430 72 72

Part of