



Investor Engagement Brief on Nature

Chemicals Sector

This is the second edition of the 'Sectoral Investor Engagement Briefs on Nature' series. It has been designed for use by the Finance for Biodiversity Foundation's members and investors involved in the Nature Action 100 initiative.

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Finance *for*
Biodiversity
Foundation

Overview

- This Investor Nature Engagement Brief on the Chemicals Sector forms part of a series of sector-focused engagement briefs on nature that have been created by the [Finance for Biodiversity \(FfB\) Foundation](#) and its members.
- The purpose of this unique series is to support investors in their engagement practices with companies on nature-related issues, notably with a series of questions that can serve as a starting point to build relationships between investors and the companies that they are engaging with on nature.
- The Chemicals sector is one of the priority sectors for the Nature Action 100 investor initiative, and this engagement guide has been designed to support investors that are involved in that initiative.
- The Chemicals sector generates over 6% of the overall impact on biodiversity from companies in the MSCI ACWI Index¹ which means that this sector ranks third of all identified sectors with an impact on biodiversity.
- The sustainable transformation of this sector is important for biodiversity because chemical pollution threatens 20% of the world's red-listed species², and for some of them, it's the main factor pushing them toward extinction.
- According to the ENCORE database, the most material impact drivers in the upstream part of the Chemicals sector's value chain are: soil and water pollutants; solid waste; area of land use; water use; non-GHG emissions; and disturbances. The main impact drivers of the Chemicals sector's direct operations are: soil pollutants; GHG emissions; and disturbances.
- The FfB Foundation identifies that the sector can contribute to the achievement of the following targets of the Global Biodiversity Framework: Participatory and Biodiversity-Inclusive Spatial Planning and Restoration of Degraded Ecosystems (Targets 1, 2 and 3); Reduce Pollution Risks (Target 7); Climate Action for Biodiversity (Target 8); Disclosure of Risks, Dependencies, and Impacts on Biodiversity (Target 15); and Enabling Sustainable Consumption Choices (Target 16).
- *This Investor Engagement Brief is designed to support investors engaging with companies in the chemical sector. However, it is important to note that the use of chemicals by companies further down the value chain is a significant driver of nature loss (e.g. in agriculture). Investors who wish to address the full value chain impact of chemicals should consider engaging with those companies as well.*

1. The MSCI ACWI 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 and 24 Emerging Markets with over two thousand constituents.

2. See: [Chemical Pollution - This is the secret cause of biodiversity loss](#) (ChemSec, 2023)

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What's inside the brief

This brief is made up of four sections

The **first section** provides an overview of the sector including how the sector specifically impacts and depends on nature, particularly in sensitive locations. It then looks at some of the most forward-looking regulations on biodiversity that can inspire investors as they help to guide the transformation of the companies in their portfolio. Finally, this section considers how the sector links to the objectives of the goals and targets of the Kunming-Montréal [Global Biodiversity Framework](#) (GBF); an international agreement adopted in December 2022 under the [UN Convention on Biological Diversity](#) (CBD) which sets out an ambitious pathway to reverse biodiversity loss by 2030 and to reach the global vision of a world living in harmony with nature by 2050.

The **second section** then considers, in detail, some of the most relevant sector-specific company actions that investors can expect of companies at different stages of their journey to address biodiversity loss.

The **third section** lays out a series of questions that can serve as a starting point for investors planning to engage with companies on nature.

The **fourth section** provides a curated set of useful supporting tools that can be used to assist the engagement process.

This brief has been developed in alignment with the sectoral guides published by [the Taskforce on Nature-related Financial Disclosures](#) (TNFD)³ and the partnership between [Business for Nature](#) (BfN), the [World Economic Forum](#) (WEF) and the [World Business Council for Sustainable Development](#) (WBCSD) as well as the sectoral reports from [Planet Tracker](#). This brief has been written by investors for investors.

The FfB Foundation has also produced a more general [Guide on Engagement with Companies](#) for financial institutions that are looking for ways to engage with companies on biodiversity across multiple sectors.

3. The TNFD is a market-led, science-based and government-backed initiative providing organisations with the tools to act on evolving nature-related issues



Connections between the Chemicals Sector and Nature

Introduction

As of 2024, the Chemicals sector provided essential materials for approximately 95% of all manufactured goods worldwide and accounted for US\$4 trillion in global chemical sales⁴. It is a diverse sector, covering a wide variety of activities including: Commodity Chemicals (bulk production of petrochemicals, plastics, and inorganic chemicals); Speciality Chemicals (high value, performance-enhanced chemicals such as coatings, adhesives, and synthetic fibres); Agricultural Chemicals (for crop production and pest control); and Industrial Gases. The modern economy could not function without the Chemical sector's outputs. Nonetheless, it is essential that the production and use of chemicals is done in a balanced way that does not threaten any of the nine planetary boundaries.

The Chemical sector's value chain spans raw material extraction through feedstock production, basic and intermediate chemical manufacturing, and the production of specialty chemicals and end-use products. The value chain downstream of direct chemical operations will include a wide range of chemical applications (including agriculture, plastics and consumer goods, energy, mining, and textiles) as well as 'end-of-life' (waste management and recycling). Each stage is tightly interconnected, enabling an integrated flow of materials and outputs across the chain.

Figure 1, on the next page, illustrates the value chain of the Chemicals sector proposed by the Taskforce on Nature-Related Financial Disclosures (TNFD). Companies will need to map out their full value chain⁵ to have a clear view of the impacts on nature caused, or contributed to, by a business and its supply chain, as well as the dependencies of the business on nature.⁶

The chemicals industry exhibits a varied concentration across different market segments. Large multinational corporations dominate the production of basic and commodity chemicals due to the scale and capital-intensive nature of these operations. Speciality chemicals, on the other hand, may see a higher degree of fragmentation, with smaller, specialised firms playing a significant role.

4. [Nature Positive: Role of the Chemical Sector, WEF \(2024\)](#)

5. A value chain goes beyond the selling of goods and products by offering value throughout the customer journey, from marketing to after-sales support. The supply chain focuses on sourcing materials and delivering goods to the customer.

6. See: <https://tnfd.global/about/why-nature-matters/>

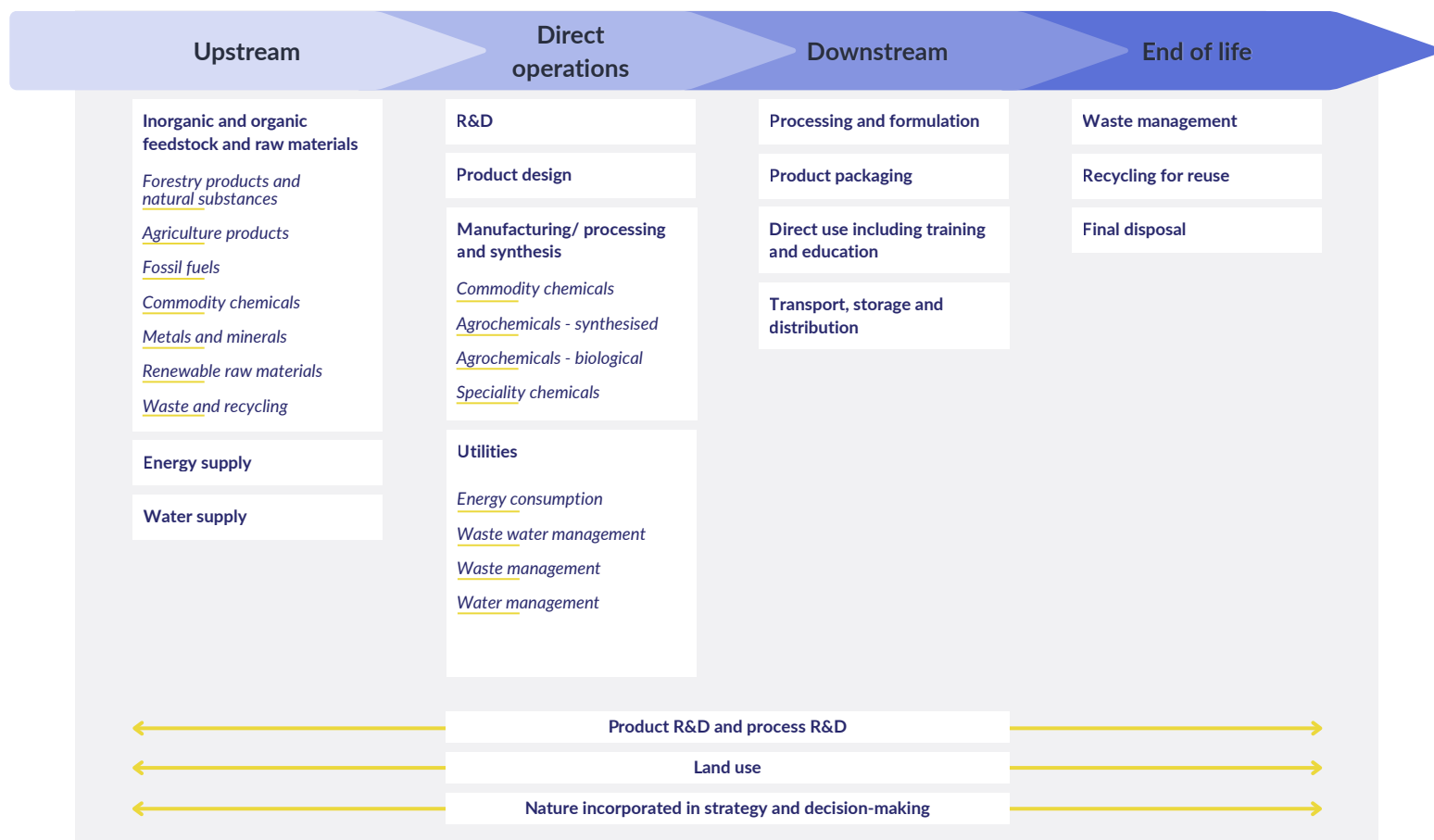


Figure 1: Value chain illustration proposed by the TNFD for the Chemicals sector, [TNFD Additional Sector Guidance, Chemicals](#) (2025)

Table 1, on the next page, provides a broad approximation of how production across the four major categories is distributed across different regions of the global market.

The range of products produced by the Chemicals sector is vast, from basic materials such as hydrogen to more complicated substances such as the wide variety of plastics, through to speciality chemicals such as per- and polyfluoroalkyl substances (PFAS). In addition, some of the products are relatively benign in terms of their impact on nature and human health, while others are either toxic to life (e.g. benzene) or have a deleterious impact because they accumulate in the ecosystem (all non-biodegradable plastics), or both (e.g. polychlorinated biphenyls⁷).

7. Polychlorinated biphenyls (PCBs) were largely banned or heavily regulated under the 2001 Stockholm Convention, however a 2024 study highlighted the possibility that significant quantities are being generated as unintentional by-products of other chemical production processes (Megson, D., Idowu, I. G., & Sandau, C. D. (2024). Is current generation of polychlorinated biphenyls exceeding peak production of the 1970s? *Science of The Total Environment*, 924, 171436. <https://doi.org/10.1016/j.scitotenv.2024.171433>)

Region/Segment	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial gases
Asia-Pacific	Dominant	Dominant	Significant	Significant
North America	Significant	Significant	Significant	Significant
Europe	Significant	Significant	Significant	Significant
Latin America	Minor	Minor	Minor	Minor
Middle East/ Africa	Minor	Minor	Minor	Minor

Table 1: Estimated distribution of chemical production across geographic regions. Finance for Biodiversity Foundation estimates based on a variety of industry sources.
Key: Dominant (>40% market share), Significant (15%-40%), Minor (<15%)

Similarly, PFAS, sometimes referred to as “Forever Chemicals”, are a large, complex group of synthetic chemicals that have been used in consumer products around the world since about the 1950s. For example, PFAS are used to keep food from sticking to packaging or cookware, make clothes and carpets resistant to stains, and make firefighting foam more effective. PFAS molecules have a chain of linked carbon and fluorine atoms, and because the carbon-fluorine bond is one of the strongest, these chemicals do not degrade easily in the environment. They can remain in the soil, water, or air for years and be transported over long distances, with some linked to adverse health effects in humans and animals.⁸

Investors generally use the [Global Industry Classification Standard](#)⁹ (GICS) to manage and track the progress of the companies in their portfolio as well as determine which specific type of activities the companies in their portfolio are involved in.

However, governments and other organisations, particularly those focused on assessing nature-related activities, use alternative coding systems such as NACE¹⁰ that don’t precisely match to the GICS system. In particular, tools that help organisations explore their exposure to nature-related risk and take the first steps to understand their dependencies and impacts on nature, such as the Science Based Targets Network (SBTN) [Materiality Screening Tool](#) (MST)¹¹ and ENCORE¹², use the ISIC system¹³.

8. [WEF -Nature Positive: Role of the Chemical Sector Report \(2024\)](#)

9. The Global Industry Classification Standard (GICS) is an [industry taxonomy](#) developed in 1999 by [MSCI](#) and [Standard & Poor's](#) (S&P) for use by the global financial community.

10. The Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE, is the [industry standard classification system](#) used in the EU.

11. The SBTN's MST is designed to help users carry out a first screening of the types of environmental impacts that are potentially materially relevant to the direct and upstream operations of a sector and a company's activities

12. ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure)

13. The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities.

The Nature Action 100 investor initiative groups the companies that it focuses on into eight sectors based on the Sustainable Industry Classification System (SICS)¹⁴.

As a result, it is particularly important for investors engaging with companies to understand these alternative systems so that they can identify where the impacts are occurring and which actors can have the most influence to transform practices for the overall processes in the sector.

This guide is structured to provide useful insights and to support engagement with companies in the Chemicals sector, whichever classification system is being used by the financial institution¹⁵. We have summarised how the economic activities covered by the sector are classified under a selection of different economic coding systems in Appendix 2.

How this sector impacts and depends on nature

It is crucial for investor engagement practices to be anchored in science and focused on the actions that will do most to help drive the sustainable transformation of companies toward the goals and targets of the Kunming-Montréal [Global Biodiversity Framework](#) (GBF). Understanding, as well as measuring, how this sector impacts and depends on nature is, therefore, essential for the better management of supply chains and to encourage more biodiversity-friendly and regenerative practices.

The Chemicals sector was identified as generating over 6% of the overall impact on biodiversity from companies in the FfB Foundation [multi-tool analysis](#)¹⁶. This analysis aggregated and normalised the results from four biodiversity impact assessment tools to provide biodiversity footprint scores of high-impact sectors and industries. The Chemicals sector ranks third against the other 73 GICS Level 3 Industries covered by the MSCI ACWI used in the multi-tool study¹⁷.

ChemSec has noted that the Chemicals sector threatens 20% of the world's red-listed species and for some of them, it is the main factor pushing them toward extinction.¹⁸

The 2024 WEF report ([Nature Positive: Role of the Chemical Sector](#)), identifies the top four drivers of nature loss relating to the chemical sector as:

- Water use;
- Pollution and chemical run-off;
- Greenhouse gas emissions; and
- Land-use change.

14. SICS uses sustainability profiles to group similar companies within industries and sectors. In SICS, a company's sustainability risks and opportunities are more important for its classification than other traditional factors, such as economic cycles and revenue streams

15. The Nature Action 100 investor initiative uses SICS when allocating companies to sectors for engagement purposes. Commercial banks often use NACE and ISIC codes in their analysis of their lending portfolios.

16. This figure includes direct operations and upstream and downstream value chain impacts

17. These studies used the MSCI ACWI Index 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 and 24 Emerging Markets with over two thousand constituents.

18. [Chemical Pollution - This is the secret cause of biodiversity loss](#), ChemSec, 2023

Assessing impacts using ENCORE

The ENCORE¹⁹ database provides a tool for financial institutions that allows them to identify the potential impacts ('pressures') and dependencies on nature for sectors of the economy, both in terms of their direct operations and also their value chain.

As part of the 2024 update of ENCORE, information on key upstream and downstream value chain links was added, covering two tiers upstream and two tiers downstream from the direct operations.

The actual nature impacts and dependencies of a particular company in the chemical sector will vary depending on the products it is producing and the business models and locations of the companies in its value chain.

Terminology nature impacts

ENCORE, TNFD and SBTN use similar concepts but apply different terminology when discussing 'impacts'.

ENCORE focuses on the potential impact that a sector can have on nature as a result of its direct operations and those in its value chain. In ENCORE 'impacts' refer to categories of environmental pressures associated with an economic activity (e.g., water abstraction, land use change, pollution, resource extraction). These are sector-level indicators of the typical intensity of pressures exerted on nature. **ENCORE ratings** (e.g., "Very High") therefore **signal the potential significance of a pressure for a given sector**, but they do not measure the resulting ecological state change, nor are they location-specific. In other words, ENCORE highlights potential impact, not actual impact.

By contrast, **SBTN and TNFD distinguish clearly between the potential impact (the 'pressure' (SBTN) or 'impact driver' (TNFD) - which are equivalent to ENCORE's 'pressures'), and the actual impact on nature.**

In **SBTN terminology**, a 'pressure' (e.g., water withdrawal) may lead to an 'impact', defined as a change in the state or functioning of ecosystems. **TNFD** uses the term 'impact driver' (instead of 'pressure') and 'impacts on nature' for the resulting ecological change.

In this guide, consistent with SBTN and TNFD, 'impact' refers to actual changes in the state of nature, and 'pressure' or 'potential impact' refers to the potential harm.

ENCORE's impact categories (pressures), SBTN pressures and TNFD impact drivers can each be mapped to the IPBES five drivers of nature loss: (1) land and sea use change, (2) direct exploitation of organisms, (3) climate change, (4) pollution, and (5) invasive alien species.

However, SBTN and TNFD extend the framework by distinguishing between the driver/pressure itself and the resulting change in ecosystem state. This distinction is important: a sector may exert a high level of pressure associated with one or more IPBES drivers, but the actual impact on nature of a sector and/or a specific company depends on geographic context, ecosystem sensitivity and cumulative effects.

It is also important to note that a single 'pressure' (e.g. Emissions of toxic pollutants to water and soil") can result in multiple 'impacts' on nature.

19. <https://encorenature.org/en/about/about-encore>

The TNFD has published a detailed summary of the chemical sector's potential nature impacts, as shown in the ENCORE database (scale from Very Low to Very High) which provides a clear insight into the effects that different chemical products and supply chains will have on a company's potential nature impacts - see Figure 2.

	ISIC Class	Manufacture of other chemical products	Manufacture of basic chemicals	Growing of cereals (except rice), leguminous crops and oil seeds	Manufacture of refined petroleum products	Fossil fuels energy production	Research and experimental development on natural sciences and engineering	Manufacture of fertilizers and nitrogen compounds	Silviculture and other forestry activities
Land, freshwater and ocean use change	Area of land use	Low	Low	High	Low	Medium	Low	Low	Very high
	Area of seabed use	N/A	N/A	N/A	N/A	ND	ND	N/A	N/A
	Area of freshwater use	N/A	N/A	Medium	N/A	Medium	ND	N/A	N/A
Climate change	Emissions of GHG	Medium	Medium	Medium	Medium	Very high	Low	Medium	ND
Pollution/ pollution removal	Emissions of non-GHG air pollutants	Medium	Medium	High	High	Very high	Low	Medium	Very high
	Disturbances (e.g noise, light)	Very high	Very high	Medium	Very high	Very high	Low	Very high	High
	Emissions of toxic soil and water pollutants	Very high	Very high	High	Very high	Very high	Low	Very high	High
	Emissions of nutrient soil and water pollutants	N/A	N/A	Very high	N/A	N/A	ND	Very high	High
	Generation and release of solid waste	Medium	Medium	High	Medium	High	Medium	Medium	Low
Resource use/ replenishment	Volume of water use	Medium	Medium	Very high	Low	Medium	Medium	Medium	Medium
	Other biotic resource extraction	N/A	N/A	ND	N/A	N/A	Very low	N/A	ND
	Other abiotic resource extraction	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A
Invasive alien species introduction/ removal	Introduction of invasive species	N/A	N/A	Very high	N/A	N/A	Low	N/A	High

Figure 2: TNFD summary of potential nature impacts for the chemical sector as shown in ENCORE (2024 version), [Additional sector guidance – Chemicals, June 2024, TNFD](#)

GHG emissions

The chemical sector produced over 6% of the world's GHG emissions, and about 40% of all industrial emissions in 2021²⁰. This is primarily driven by the demand for fossil fuels as feedstock, due to high manufacturing energy demands. It is estimated that the sector is responsible for around 10% of the global fossil fuel consumption²¹. The increased warming potential generated from burning these fossil fuels accelerates climate change, and therefore, the impact that this has on biodiversity.

Freshwater

The chemicals and petroleum refining sectors in Europe collectively utilise 11% of freshwater resources. On a global scale, the industry as a whole consumes 5-10% of freshwater²², and has a negative impact in terms of soil and water pollution. Although there are many regulations throughout the EU and the US to manage pollution levels, hazardous waste released into land, air, and water still occurs on a widespread scale across the globe. This can be in the form of: chemical pesticides in air, land and water; excessive nitrate fertilisers in land and water; or fossil-based chemicals released into the air. Since 2006, the EU has launched three initiatives: the [Safe and Sustainable by Design](#) framework for chemicals and materials - a voluntary approach to guide the innovation process for chemicals and materials; also a law to protect human health and the environment from the risks that can be posed by chemicals called Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH); and the Classification, Labelling and Packaging (CLP) regulation governing the classification, labelling, and packaging of chemical substances and mixtures.²³ However, enforcement of these frameworks has been lacking, and thus pollution continues.²⁴

Commodities (energy and fuel)

The Chemicals sector relies on commodities that can be used to produce energy and/or be used as feedstock, such as coal, which is particularly prevalent for Chinese companies²⁵. Today, 99% of hydrogen production (produced by some chemical companies) globally uses gas and coal inputs for production. These commodities are presented in the [SBTN High-Impact Commodities List](#) (HICL), which is a non-exhaustive list of the most common environmental pressures associated with the production of major commodities. Table 2, on the next page, presents the potential nature impacts associated with common commodities used in the Chemicals sector: liquified natural gas; oil/petroleum; gasoline; and coal.

20. WRI Climate Watch, 2021 data <https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors>

21. [Decarbonizing Chemicals Part One](#), S&P Global (2023).

22. Cutting water use in the European chemical industry | E4WATER Project | Results in brief | FP7 | CORDIS | European Commission (europa.eu): <https://cordis.europa.eu/article/id/151163-cutting-water-use-in-the-european-chemical-industry>

23. REACH was adopted on 18th December 2006, CLP was adopted on 16th December 2008, and the Safe & Sustainable by Design framework was adopted on 8th December 2022

24. [ECHA Pilot Project \(2020\)](#), [ECHA 2024-2025 Priorities](#), [EU Safety Gate Report 2023](#)

25. [Chemicals Industry Overview](#), IEA (2023).

Commodity	Liquefied natural gas (LNG)	Oil (crude) / Petroleum	Gasoline	Coal
Land use and land change	×	×		×
Freshwater ecosystem use/change	×	×	×	×
Marine ecosystem use/change	×	×		
Water Use	×	×	×	×
Other resources use	×	×		×
Soil pollution	×	×	×	×
Freshwater Pollution	×	×		×
Water pollution	×			
Marine pollution		×	×	
Solid Waste				
Climate change	×	×	×	×
Non-GHG air pollution	×			

Table 2: Potential nature impacts of the commodities relied on by the Chemicals sector, SBTN High-Impact Commodities List (HICL)

However, shifting to lower-emission energy sources can have implications for water resources. One example of this is green hydrogen²⁶, a vital tool for decarbonisation in certain chemical companies. Green hydrogen has the potential to substitute for natural gas as the primary feedstock in the production of ammonia, however producing green hydrogen relies on water as a fundamental feedstock.

As more and more companies switch their fossil-fuel-based feedstocks to bio-based feedstocks as part of their decarbonisation strategies, terrestrial use will constitute a growing threat to biodiversity. Without safeguards or strict regulation, the increasing demand for bio-based feedstocks could threaten natural ecosystems, as they are converted from natural habitats to land for farming bio-based fuels and feedstocks. An example of this would be Poland's Białowieża Forest²⁷ which is facing increasing pressure in this respect.

26. Hydrogen produced by electrolysis of water using electricity from renewable sources

27. See: <https://whc.unesco.org/en/list/33/>

Assessing dependencies (ENCORE)

In addition to the impacts discussed above, it is important to consider the sector's dependency on natural systems and their ecosystem services. For example, the chemical sector is heavily reliant on water supply (groundwater and surface water) for many manufacturing processes. Thus, unsustainable water use practices, particularly in areas of water stress, can enhance risks for the sector and the financial assets derived from it.

The ENCORE tool can be used to identify the key nature dependencies²⁸ of a sector (on a scale from Very Low to Very High). The key (HIGH or VERY HIGH) dependencies of the Chemicals sector only apply to the manufacture of fertilisers and nitrogen compounds – the ratings for other chemical manufacturing activities are MEDIUM or lower:

- Water Supply: HIGH.
- Water Flow Regulation: HIGH.

Refer to Appendix 1 for more details on these ecosystem services.

The TNFD report referred to earlier provides a more detailed analysis of the sector's dependencies including upstream parts of the value chain – see Figure 3 on the next page.



28.[1] ENCORE can also be used to identify impacts but unlike the SBTN's MST it does not provide a quantitative score– refer to Appendix 1 for more details.

	ISIC Class	Manufacture of basic chemicals	Manufacture of other chemical products	Manufacture of fertilizers and nitrogen compounds	Silviculture and other forestry activities	Growing of cereals (except rice), leguminous crops and oil seeds	Manufacture of refined petroleum products	Fossil fuels energy production	Research and experimental development on natural sciences and engineering
Provisioning services	Water supply	Medium	Medium	High	High	High	Low	High	Low
	Genetic material	N/A	N/A	N/A	Very high	Very high	N/A	N/A	Medium
	Other provisioning services – Animal-based energy	N/A	N/A	N/A	Low	Medium	N/A	N/A	N/A
	Biomass provisioning	N/A	N/A	N/A	Very high	Very high	N/A	N/A	Low
Regulating & maintenance services	Solid waste remediation	Low	Medium	Medium	Medium	Medium	Low	Medium	Low
	Soil and sediment retention	Medium	Medium	Medium	Very high	Very high	Medium	Medium	Very low
	Water purification	Medium	Medium	Medium	Very high	Very high	High	Medium	Medium
	Soil quality regulation	N/A	N/A	N/A	Very high	Very high	N/A	N/A	N/A
	Other regulating and maintenance service	Low	Low	Low	ND	Medium	Low	N/A	Very low
Regulating & maintenance services	Biological control	N/A	N/A	N/A	High	High	N/A	N/A	Very low
	Air Filtration	Very low	Very low	Very low	Medium	Medium	Very low	Very low	Very low
	Flood control	Medium	Medium	Medium	High	High	Medium	Medium	Very low
	Genetic material	N/A	N/A	N/A	Very high	Very high	N/A	N/A	Medium
	Global climate regulation	Very low	Very low	Very low	Very high	Very high	Very low	Medium	Low
	Nursery population and habitat maintenance	N/A	N/A	N/A	High	Very low	N/A	N/A	N/A
	Noise attenuation	Very low	Very low	Very low	N/A	N/A	Very low	Very low	Very low
	Other regulating and maintenance service	Very low	Very low	Very low	N/A	N/A	N/A	N/A	Very low
	Local (micro and meso) climate regulation	Low	Low	Low	Very high	Very high	Low	Low	Low
	Pollination	N/A	N/A	N/A	Medium	High	N/A	N/A	Low
	Storm mitigation	Medium	Medium	Medium	Medium	High	Medium	Low	Low
	Water flow regulation	Medium	Medium	High	Medium	High	Medium	High	Low
Regulating & maintenance services	Rainfall pattern regulation	Very low	N/A	Medium	Very high	Very high	N/A	N/A	N/A
	Recreation related services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Visual amenity services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Education, scientific and research services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Very high
Cultural services	Spiritual, artistic and symbolic services	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A

Figure 3: TNFD summary of nature dependencies for the chemical sector as shown in ENCORE (2024 version), [Additional sector guidance – Chemicals, June 2024, TNFD](#)

Downstream impacts

The Chemicals sector itself is a key supplier for a number of other sectors that have significant potential impacts on nature. This Sector Brief is designed to support investors engaging with companies in the Chemicals sector, however, investors wishing to take a more systemic approach should also consider including one or more of the following sectors in their chemicals engagement strategy:

- **Agriculture** – significant potential impacts through the use of agrochemicals (particularly nitrogen fertilisers, pesticides, and herbicides).
- **Plastics**, packaging and consumer goods manufacturing – plastic pollution is a significant and growing (cumulative) threat to nature and human health (and plastics regulation will have an impact in chemical producers).
- **Textiles** – major potential pollution impacts on freshwater as a result of the chemicals used on the wet processing stage of textiles production (including synthetic dyes, tanning agents, and finishing treatments involving highly persistent chemicals such as PFAS).
- **Consumer cleaning and household products** – potential pollution impacts on the aquatic environment from surfactants, disinfectants, antimicrobial agents, and fragrances. Pollution release is low-level but continuous and unregulated for the end user.
- **Pharmaceuticals** – active pharmaceutical products are derived from chemical sector inputs; pollution of the environment can lead to hormonal disruption in aquatic species and antimicrobial resistance with severe consequences for human health.
- **Electronics and other specialty industrial applications** – solvents, etching agents, flame retardants, and specialty coatings can all constitute pollution threats to the environment, with persistent and cumulative impacts.
- **Energy & Mining** – effects are likely to be localised, but the release of chemicals such as drilling additives and flotation reagents can cause long-term ecosystem damage, particularly to aquatic systems, and cause human health impacts from contaminated freshwater.

This list is not exhaustive since chemicals have such widespread use so other sectors might be more relevant depending on the underlying investment strategy and portfolio construction.

The downstream pollution role of agriculture and plastics manufacturing is particularly important since the volumes of chemicals used are so significant, and the business model in both cases involves deliberately placing those chemicals (or their derivatives) into the environment. In contrast, the pollution caused by the other sectors is a by-product of their production processes and so is potentially easier to control (and also more likely to be regulated).

Regulation is discussed later in this Sector Brief. Any tightening of controls over agrochemical use or plastics production will have significant impacts on the demand for chemicals and thus on the chemical sector itself.

Priority locations within the sector value chains

As expressed in the [TNFD recommendations](#)²⁹, nature-related impacts and dependencies are location-specific and therefore require local, context-specific assessment and responses. As a result, investors benefit from knowing the locations that are linked to the supply chain of an overall industry. The TNFD provides sectoral guidance for individual companies on how to 'Locate' their impacts on biodiversity, as the first step of their [LEAP assessment](#) (Locate-Evaluate-Assess-Prepare), a four-step integrated assessment framework for nature-related issues.

Companies and investors should focus on 'priority locations' i.e. areas that are:

- **Material locations** – where the organisation has material nature-related impacts, dependencies, risks and/or opportunities; and/or
- **Sensitive locations** – defined by the TNFD as ecologically sensitive locations that meet one or more of five criteria: important for biodiversity, including species; and/or areas of high ecosystem integrity; and/or areas of rapid decline in ecosystem integrity; and/or areas of high physical water risks; and/or areas of importance for ecosystem service provision, including benefits to Indigenous Peoples, local communities and stakeholders.³⁰

The assessment of impacts on priority locations will vary greatly for each individual company.

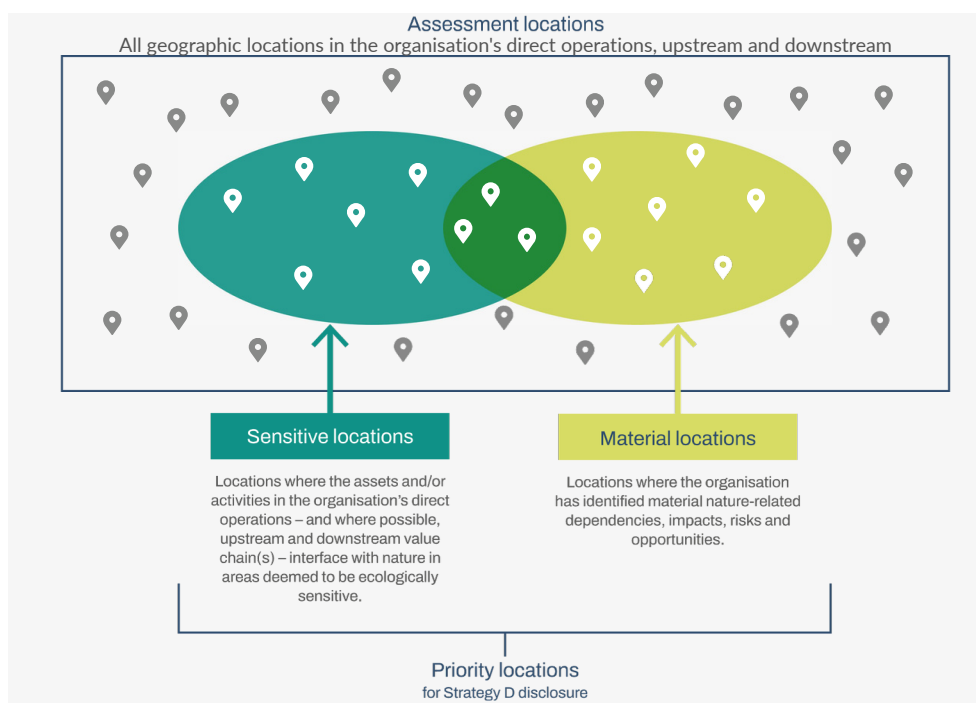


Figure 4: Priority locations, [Guidance on the identification and assessment of nature-related issues - The TNFD LEAP approach v1](#) - September 2023

29. These are recommendations that provide companies and financial institutions of all sizes with a risk management and disclosure framework to identify, assess, manage and, where appropriate, disclose nature-related issues, green transition plans, nature markets and bioeconomy investment strategies.

30. See: https://tnfd.global/wp-content/uploads/2023/08/Guidance_for_Financial_Institutions_v1.pdf?v=1695215983

Water – a key dependency (and business risk)

Many chemical production processes require a reliable supply of clean water and so this provides a useful illustration of the significance of location. Companies can use the water quality map available in the [Water Risk Filter](#) of the World Wildlife Fund to identify their exposure to the risk that water quality may be insufficient for their manufacturing processes, based on the locations of their direct and indirect operations – see Figure 5.

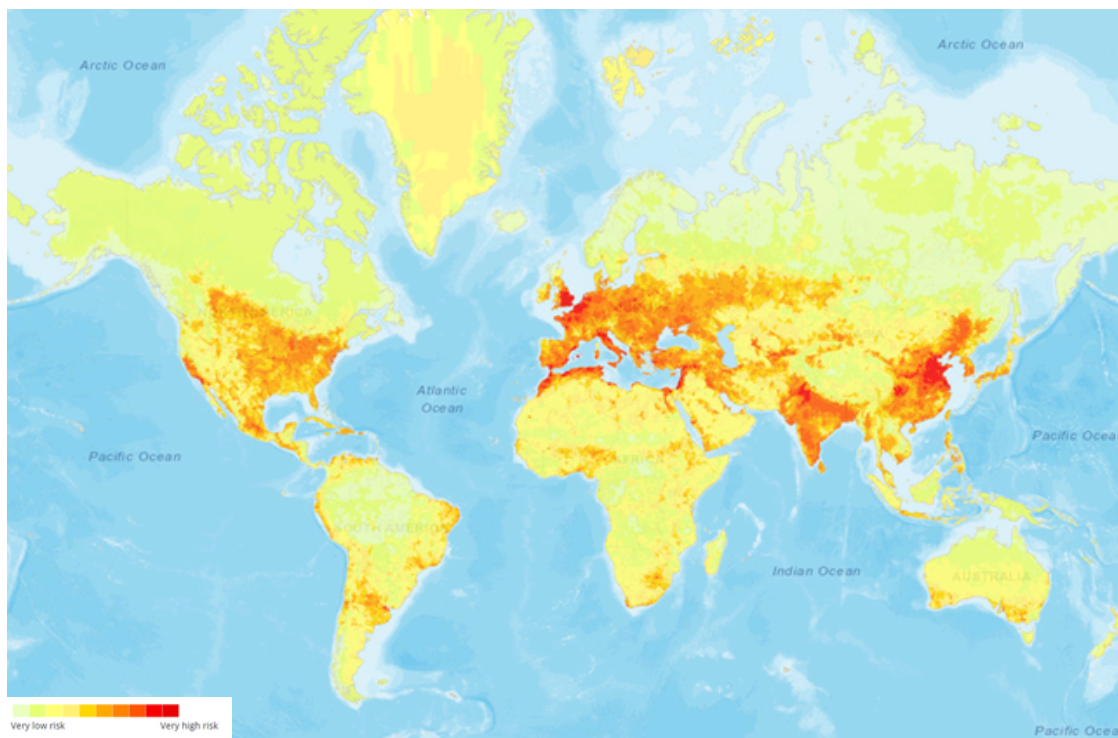


Figure 5: Map of the Global Water Quality Risk, [WWF water risk filter](#) (2024)

The “water quality” risk category in the WWF Water Risk Filter tool considers parameters including: biological oxygen demand (BOD) as a widely used umbrella proxy for overall water quality³¹; electrical conductivity (EC) as a proxy for salinity balance and pH alteration; and nitrogen, to capture nutrient loading in water bodies.

There is often an overlap between dependencies and impacts (water pollution is among the main pressures on nature exerted by the Chemicals sector), and tools like this can help with both. Direct operations or those of suppliers located in areas highlighted by the tool as ‘high water risk’ are likely to have a more serious negative impact on nature than similar activities undertaken in less sensitive locations.

Forward-looking regulations relevant to the sector

Investors can be inspired by forward-looking regulations on biodiversity to guide the transformation of the companies in their portfolio. With engagement, they can exercise influence on companies to improve their practices and be prepared in the context of a sustainable policy transition, which goes further than simply complying with current environmental safeguards.

In the Chemicals sector, the most forward-looking regulations on biodiversity have been identified in Europe, Canada, and the United States, serving as best-practice examples for setting minimum standards. In addition, the negotiations of the UN Plastics Treaty could have significant implications for the Chemicals sector since they could impact one of the main downstream components of the chemicals value chain.

Most regulations within the chemicals industry focus on GHG emissions or on environmental pollution, so we have grouped the regulations in this Sector Brief by theme rather than by country.

GHG emissions

The regulations listed below are all currently in force but include provisions that gradually increase the restrictions placed on the Chemicals sector with respect to emissions.

- [California Cap-and-Trade \(California Global Warming Solutions Act\)](#): Cap-and-trade system used to ensure the reduction of GHG emissions in the state of California. Major GHG-emitting sources, such as electricity generation (including imports) and large stationary sources (e.g. refineries, cement production facilities, oil and gas production facilities, glass manufacturing facilities and food processing plants) that emit more than 25,000 MTCO₂e per year will have to comply with this cap-and-trade programme.
- [EU Emissions Trading System \(EU ETS\)](#): The EU ETS also works on a cap-and-trade principle. It operates in all EU countries and covers emissions from around 10,000 installations in the energy sector and manufacturing industry (including the chemical industry). It was launched in 2005 and since then, it has helped bring down emissions from power and industry plants by c.50%, with a 62% reduction goal by 2030
- [EU Climate Law](#): The EU Parliament adopted the EU Climate Law on 24 June 2021, which makes the target of net zero GHG emissions by 2050 legally binding. It also includes a 2030 climate target of at least 55% reduction of net emissions of greenhouse gases as compared to 1990.
- [Quebec Cap-and-Trade \(Quebec Environment Quality Act\)](#): The system started operation in 2013 and covers c.80% of Québec's GHG emissions. The system covers fuel combustion emissions in the power, buildings, transport, and industrial sectors, as well as industrial process emissions. Its target is a 37.5% reduction from 1990 GHG levels by 2030 and carbon neutrality by 2050.

Environmental pollution

The regulations listed below are all currently in force but include provisions that allow for further restrictions to be placed on the Chemicals sector with respect to pollution.

- [The US Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants](#): This US law restricts the release of Volatile Organic Compounds and Hazardous Air Pollutants such as Sulphur Dioxide, Nitrogen Oxide, Nitrogen Dioxide, and Benzene. Part of this framework, affecting specific hazardous air pollutants, was recently [overturned by the US Congress in 2025](#).
- [EU Revised Urban Wastewater Treatment Directive](#): The revised directive, which came into force in 2025, builds on the 1991 legislation by requiring EU member states to strengthen the collection and treatment of municipal wastewater. A key feature of the revision is the mandatory removal of harmful industrial chemicals, including micropollutants. Member states have until 31 July 2027 to transpose the Directive into national law.
- [Regulation on the Registration, Evaluation, Authorisation and Restriction of CHemicals \(REACH\)](#): This is a comprehensive EU legislation governing the production and use of chemicals. Enforced since 2007, it requires companies to register and provide data on the properties and risks of substances they manufacture or import. The regulation aims to enhance the protection of human health and the environment by evaluating and managing the risks of chemicals. It also includes provisions for authorising the use of certain hazardous substances and restricting or banning substances presenting unacceptable risks.

Significant amendments to REACH have been proposed by the EU Commission which include:

- A 10-year validity period for chemical registrations, with ECHA authorised to revoke numbers if dossiers are not updated or found non-compliant;
- Digitalisation of supply chain communication, including the shift to digital safety data sheets and alignment with the Digital Product Passport (DPP) for products;
- Empowering the EU to define criteria for national enforcement systems and conduct systematic and ad-hoc audits across Member States; and
- Introduction of a Mixture Assessment Factor (MAF) to account for combined chemical exposure.

The REACH 2.0 proposals are still working their way through the EU legislative process so may be amended before being agreed. The effective date has not yet been determined.

UN Plastics Treaty

- **The United Nations Environment Assembly (UNEA) Resolution “[End Plastic Pollution: Towards an international legally binding instrument](#)”**, established an [Intergovernmental Negotiating Committee](#) (INC) in March 2022 to develop an international legally binding instrument on plastic pollution, including in the marine environment, which could include both binding and voluntary approaches, based on a comprehensive approach that addresses the full life cycle of plastics (from design through production to disposal), including chemicals and polymers of concern.
- The INC held the second part of its fifth session (INC-5.2) in Geneva in August 2025. The session closed without reaching agreement on the text of a Plastics Treaty, in spite of support from the majority of member states and many businesses.³²
- INC 5.3 was held in Geneva in February 2026, however, the meeting focused on electing a new Chair and other officers, and no substantive treaty negotiations took place. Steps beyond INC 5.3 are unclear, although INC 5.2 included an agreement to resume negotiations at a future (unspecified) date.

How the sector links to the objectives of the Global Biodiversity Framework

The sustainable transformation of the companies in the Chemicals sector can contribute to halting biodiversity loss by 2030. Below is a summary of issues to keep in mind, and also levers that could be activated in the sector, with regard to the targets of the [Global Biodiversity Framework](#) (GBF) that are most directly relevant for this sector are.

Targets 1, 2 & 3 - Participatory and Biodiversity-Inclusive Spatial Planning and Restoration of Degraded Ecosystems: Chemical companies have the responsibility to ensure that terrestrial and inland water areas, and marine and coastal areas, are effectively conserved and managed. The industry has a high impact on water and land, whether it is through pollution or the use of these resources.

Target 7 - Reduce Pollution Risks: The chemical industry is a big producer of toxic substances with a high risk of air and water pollution. Those chemicals, such as PFAS, proliferate easily in many ecosystems and are bad for human health. Additionally, the industry also produces nitrogen fertilisers used by the agricultural sector, and these fertilisers lead to significant pollution problems as a result of nitrogen run-off.

Target 8 - Climate Action for Biodiversity: Chemical companies contribute a lot to climate change because of the use of fossil fuels for energy supply or as feedstocks. The industry is responsible for over 6% of global GHG emissions³³, and the International Energy Agency estimates emissions from primary chemical production must decline by 15% by 2030 to get on track with the Net Zero Scenario³⁴.

32. For example, the Business Coalition for a Global Plastics Treaty issued a statement expressing disappointment in the outcome but support for continued efforts to agree a treaty <https://www.businessforplasticstreaty.org/latest/our-statement-on-the-inc-5-2-outcome>.

Target 15 - Disclosure of Risks, Dependencies, and Impacts on Biodiversity: Measuring, managing, and disclosing nature-related risks and opportunities by companies, including from the Chemicals sector, will ultimately support a shift in global financial flows toward nature-positive outcomes.

Target 16 - Enabling Sustainable Consumption Choices: The Chemicals sector can participate in raising awareness among their customers to help enable more informed decisions and sustainable consumption choices. Since the majority of chemical companies do not supply consumers directly, their ability to influence consumer behaviour will likely be limited, however, they should avoid lobbying against such endeavours by other companies³⁵.



33. WRI Climate Watch, 2021 data <https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors>

34. <https://www.iea.org/reports/tracking-clean-energy-progress-2023>

35. For example, a [2025 report by Friends of the Earth Europe](#) described how the lobbying activities of four major agrichemical companies led to the withdrawal by the EU Commission of the proposed 'Sustainable Use Regulation' that would have set binding targets on pesticide use in the EU. Similar lobbying activities have been [documented in the US](#) with respect to (for example) PFAS.

Part II

Recommended Company Actions to help address Biodiversity Loss

Introduction

All companies in the Chemicals sector need to have a clear plan to minimise negative biodiversity impacts and, where possible, contribute to the reversal of biodiversity loss by 2030. Ideally, this plan should be embedded in the company's overall business and climate strategy. Supply chain traceability is an essential tool for companies that wish to put in place an effective nature strategy, and effective implementation will invariably require collaboration with other companies in the value chain.

The nature strategy should follow the ACT-D framework:³⁶ Assess, Commit, Transform, Disclose³⁷.

Assess

Measure and prioritise impacts and dependencies on nature to ensure the company is acting on the most material ones.

As a starting point, investors need to ensure that companies understand their supply chains' dependency and impacts on nature, as identified through an assessment of nature-related dependencies, impacts, risks, and opportunities (DIRO), conducted following the TNFD LEAP³⁸ process.

The assessment needs to encompass biodiversity loss pressures on all relevant biomes, as well as evaluate risks and impacts across the whole supply chain, from indirect raw material and components suppliers to how consumers use and dispose of the company's products. The assessment will allow companies to identify and address the most material biodiversity risks and impacts (using tools such as ENCORE or the SBTN Materiality Screening Tool³⁹), as well as understanding its sphere of influence.

Commit (set science-based targets)

Set transparent, time-bound, specific, science-based targets to put the company on the right track towards operating within the Earth's limits and aligning with the Global Biodiversity Framework, with the aim of reversing nature loss by 2030.

36. Developed by a variety of organisations including the Capitals Coalition, Business for Nature, WBCSD, TNFD, Science Based Targets Network, WEF and WWF.

37. <https://capitalscoalition.org/business-actions/>

38. See TNFD's Tool catalogue for Nature-related data tools to help assess nature-related issues and aligned with the TNFD's LEAP approach. See: <https://tnfd.global/guidance/tools-catalogue/>

39. <https://sciencebasedtargetsnetwork.org/companies/take-action/assess/materiality-screening/>

Targets need to be ambitious (while also being achievable), set against a clear baseline, with specific cut-off dates and measurable KPIs to fulfil the company's biodiversity ambition. The targets should be based upon the company's assessment of its impacts and dependencies on nature, and should focus on the most material factors in its direct operations and those of its value chain.

The Science Based Targets Network (SBTN) provides extensive guidance for companies on how to decide which nature impacts to prioritise and how to develop, measure, set and disclose related science-based targets.⁴⁰

Transform (take action)

*The company should design an action plan using the SBTN's AR3T Action Framework: Avoid, Reduce, Regenerate, Restore, and Transform.*⁴¹

Companies at the start of their nature positive journey will need to focus on avoiding and reducing their negative impacts on nature. However, more mature companies should take actions that will actually regenerate and restore nature, with the ultimate aim of acting to transform the underlying systems that are driving nature loss.⁴²

At all stages of the value chain, it is important that companies are not simultaneously supporting business associations or other lobbying efforts that act in opposition to their nature action plans, and are engaging positively with regulators and policy makers to support the transformation of the Chemicals sector.

It is also important that the design and implementation of the plan prioritises rights-based approaches and is developed in collaboration with Indigenous Peoples and local communities when they are affected.

Companies will inevitably need to consider trade-offs when deciding what actions to take. Investors should look for clear, science-based and evidence-backed explanations to support such decisions.

Disclose

Track performance and publicly report material nature-related information on a regular and consistent basis.

Companies should use the overall reporting framework provided by the TNFD to guide them when compiling and reporting nature-related information, and their reporting should comply with the relevant sustainability reporting standards such as those provided by the ISSB, EFRAG, and the GRI.

40. <https://sciencebasedtargetsnetwork.org/step-up-for-nature/>

41. <https://sciencebasedtargetsnetwork.org/companies/take-action/act/>

42. It is worth noting that the AR3T framework does not assume a linear progression over time – companies may be undertaking actions from across the framework at any one time and involving their value chains

Recommended company actions

The specific actions taken by a company will depend on its position in the value chain, the nature of the products and services it provides, the inputs it depends on, and will be location-specific. However, given the most material impacts discussed earlier, it is possible to identify several actions that are likely to be relevant to many companies in the sector.⁴³ The actions will apply to companies' direct operations and to activities across their supply chains.

The actions that are appropriate will also depend upon the company's 'maturity level'. In this Sector Brief we have used a scale from 'basic' to 'mature' summarised in Table 3 below. The levels assigned are meant as guidance only and do not represent precise classifications.⁴⁴

Maturity level	Description
Basic	This action should be within the grasp of the majority of companies.
Intermediate	This action is more likely to require a greater level of organisational maturity with respect to nature actions.
Advanced	This action is likely to require the organisation to be applying a comprehensive ACT-D framework, and to have embedded nature into its business operations, strategy, and governance.

Table 3: Company maturity levels, Finance for Biodiversity Foundation (2025), derived from WBCSD and Capitals Coalition

More mature companies will be able to extend their actions across the majority of their operations and a larger proportion of their supply chains than less mature companies.

The recommended actions are grouped into seven categories for ease of reference.⁴⁵ The categories that align with the five priority actions recommended by the 2024 WEF report ([Nature Positive: Role of the Chemical Sector](#)) are indicated by an asterisk.

43. The 'Assess' and 'Commit' stages of the ACT-D framework obviously involve taking action; in addition, positive policy engagement is an essential tool that should be deployed alongside any set of actions to align with the 'Transform' element of ACT-D. These elements are not included in the action lists in this section to avoid repetition.

44. There are numerous ways to define maturity level – investors can refer to WBCSD's [Roadmaps to Nature Positive - Foundations for all businesses](#) and the Capitals Coalition [Maturity Tool](#) for further guidance.

45. In practice, many actions will relate to more than one category

- Reduce water use and improve water stewardship;*
- Reduce pollution;*
- Reduce GHG emissions;
- Reduce solid waste and expand circularity;*
- Reduce land-use impacts and restore ecosystems;*
- Sustainable sourcing and lower-impact materials;* and
- Building responsible supply chains.

The actions are shown on a heatmap to indicate:

- 1 the subsectors they are most relevant to [no colour indicates less relevance];
- 2 the likely biodiversity benefit from taking the action (high or lower); and
- 3 the likely feasibility of the action in the near to mid-term (dependent on cost, current technology, regulatory clarity, etc).⁴⁶

Companies should prioritise more feasible actions with a high benefit to nature, as summarised in Table 4.

		Feasibility	
		'Easy'	'Difficult'
Benefit to nature	High	Priority 1 - P1	Priority 2 - P2
	Lower	Priority 3 - P3	Priority 4 - P4

Table 4: Prioritising actions (nature benefit vs feasibility)⁴⁷, Finance for Biodiversity Foundation. Priority codes in [square brackets] with no colour coding are shown to provide additional information but are unlikely to be relevant to the majority of companies in the subsector.

46. Feasibility is estimated independent of the maturity of the company. However, more mature companies are more likely to be able to undertake actions that are judged to be less feasible ('difficult') where organisational capacity (knowledge, and resources) is an important factor. For example, creating products that are 'safe and sustainable by design' is challenging, but mature organisations are more likely to have the capacity to achieve this due to stronger leadership, human resources, supplier relationships, etc. Conversely, some 'easy' actions will still be more challenging for organisations with lower capabilities

47. Important caveat: the 'feasibility' of a particular action is based on broad judgements, not on detailed analysis, and changes in technologies, regulation, and other factors may significantly change the assessed feasibility of an action in the future

Reduce water use and improve water stewardship

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Perform water scarcity risk assessments to identify vulnerabilities in water-stressed regions, prioritise actions in those locations, and prepare for potential disruptions	Basic	P1	P1	P1	P1
Conduct regular audits and provide employee training	Basic	P3	P3	P3	P3
Invest in water-efficient technologies and optimise processes to reduce water requirements	Basic	P1	P1	P1	P1
Implement recycling and reuse systems to minimise freshwater demand	Intermediate	P1	P1	P1	P1
Collaborate with stakeholders to strengthen water management practices in priority locations	Intermediate	P2	P2	P2	[P3]
Install integrated water systems, upgrade treatment to maximise water recovery, introduce closed-loop systems and replace water-cooled with air-cooled processes where feasible	Intermediate	P1	P1	P1	P1
Engage local communities and Indigenous Peoples to ensure that the company is using water in accordance with FPIC principles	Advanced	P2	P2	P2	[P4]
Replenish watersheds and remediate water stress in priority basins and supply chains	Advanced	P2	P2	P2	[P3]

Reduce pollution (air, water, soil)

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Ensure all facilities meet site-level emissions regulations	Basic	P1	P1	P1	P1
Deploy technologies to capture and treat harmful emissions to prevent them reaching the environment	Basic	P1	P1	P1	P1
Implement site-level risk assessments and end-of-life management for chemicals and by-products to mitigate ecotoxic and nutrient pollution	Basic	P1	P1	P1	[P3]
Identify and manage persistent and emerging pollutants (e.g. PFAS, plastic pellets), including substitution, phase-out where feasible, and loss prevention	Intermediate → Advanced	P2	P1	[P3]	[P3]
Reduce nutrient and pesticide pollution through product design, stewardship and customer education (e.g. precision application, reduced toxicity portfolios)	Intermediate → Advanced	[P4]	[P4]	P1	[P4]
Adopt circular sourcing models for solvents, reagents, buffers and feedstocks, embedding circularity in product and process design	Advanced	P2	P1	[P4]	[P4]
Collaborate across industry to identify and prioritise the most material and ecotoxic effluents for reduction	Advanced	P2	P1	P2	[P4]
Partner with wastewater treatment plants to strengthen removal of ecotoxic chemicals and prevent downstream accumulation	Advanced	P2	P1	P2	[P4]

Note: the actions labelled 'Intermediate -> Advanced' should be within the grasp of companies at the 'Intermediate' maturity stage, but are likely to require those companies to progress to 'Advanced' maturity to ensure success. Investors should judge companies on their success completing these transitions rather than starting the process.

Reduce greenhouse gas (GHG) emissions

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Increase efficiency in manufacturing, storage and distribution processes, focusing on high-demand systems such as HVAC (heating, ventilation, and air-conditioning) and purified water systems	Basic	P1	P1	P1	P1
Use product-level life-cycle assessment (LCA) to identify priority areas for emission reduction	Basic	P3	P3	P3	P3
Expand the use of renewable energy, electrification and low-carbon feedstocks to reduce fossil fuel dependency	Intermediate	P1	P1	P1	P1
Adopt green chemistry techniques to reduce emissions intensity in manufacturing	Advanced	P2	P1	[P4]	[P4]

Reduce solid waste and expand circularity

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Enhance material efficiency by maximising yield, adopting continuous manufacturing and redesigning product systems to minimise waste	Basic	P3	P3	P3	P3
Work with recyclability standard-setters and regulators to ensure comprehensive guidance and enable timely adoption	Basic	P3	P3	[P4]	[P4]
Review and redesign product packaging and components to reduce material use, increase recycled content and move away from virgin plastics and paper	Basic	P3	P3	P3	[P4]
Support circularity-friendly policies by working with policymakers on waste-reduction initiatives	Intermediate	P4	P4	[P4]	[P4]
Minimise hazardous waste generation, implement closed-loop systems and invest in recycling infrastructure	Intermediate	P1	P1	P1	[P4]
Collaborate across the value chain to design out waste and promote circular business models	Advanced	P2	P1	[P4]	[P4]

Reduce land-use impacts and restore ecosystems

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Adopt procurement approaches requiring sustainable land-use practices (e.g. certified palm oil, FSC-certified paper)	Basic	P2	P2	P1	[P4]
Ensure site selection and raw material sourcing respects Indigenous and local community rights and is supported by FPIC	Basic	P2	P2	P1	[P4]
Integrate biodiversity into site selection and planning; use spatial planning tools (e.g. IBAT) to avoid Key Biodiversity Areas	Intermediate	P2	P2	P1	[P4]
Support ecosystem conservation and restoration within and beyond value chains, and advocate for progressive nature-positive policy	Advanced	P2	P2	P2	[P4]

Sustainable sourcing and lower-impact materials

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Identify key chemical and agricultural inputs and evaluate environmental impacts and risks using LCAs and tools such as the SBTN High Impact Commodity list	Basic	P1	P1	P1	P1
Require responsible sourcing of raw materials, including certification where available and compliance with Access & Benefit Sharing rules	Basic	P2	P2	P2	[P4]
Improve supply chain traceability, ideally to raw-material level	Intermediate	P2	P2	P2	[P4]
Reduce dependency on high-impact commodities such as petrochemicals and virgin plastics	Advanced	P2	P1	[P4]	[P4]
Develop lower-toxicity, biodegradable and “safe-and-sustainable-by-design” chemical products	Advanced	[P4]	P1	P2	[P4]

Building responsible supply chains

Action	Maturity	Commodity chemicals	Speciality chemicals	Agriculture chemicals	Industrial chemicals
Include human rights safeguards in supplier agreements, aligned with the UN Guiding Principles on Business & Human Rights	Basic	P3	P3	P3	P3
Support supplier capacity building through training, joint improvement plans and knowledge-sharing	Intermediate	P3	P3	P3	[P4]
Enhance supply chain transparency by mapping to lower-tier suppliers and identifying critical raw material sources	Intermediate	P3	P3	P3	[P4]
Integrate environmental stewardship requirements into supplier contracts (e.g. GHG reduction, water efficiency, pollution control)	Intermediate	P1	P1	P1	P1
Integrate environmental stewardship requirements into supplier contracts (e.g. GHG reduction, water efficiency, pollution control)	Advanced	P2	P2	P2	[P4]

Finance for Biodiversity Foundation's Call to Action: Questions for Investors to Engage Companies on Nature

As investors enter into engagements with companies from the Chemicals sector, the list of questions below can be used as a checklist to evaluate companies' reporting and performance, and to identify areas where investors should request further information and/or push for more ambitious actions. The questions have been organised following the structure of the [Nature Action 100 Investors Expectations](#), covering ambition, assessment, targets, implementation, governance, and engagement with stakeholders.

A number of the questions are cross-sectoral and have been applied across all of our briefs. The **questions coloured in blue are specific to the sector focus of this particular brief**. The questions are divided into those that are likely to be answered in company reports (assuming adequate disclosure), and those that are more likely to be answered during the engagement process.⁴⁸



48. The extent to which questions can be answered from company reports is a potential indicator of the company's maturity

1. Ambition

Companies need to publicly commit to minimise contributions to key drivers of nature loss and to conserve and restore ecosystems at the operational level and throughout value chains by 2030.

Disclosure-based questions (from reports)

- | | |
|--|---|
| <p>1A Does the company publicly commit to minimising contributions to key drivers of nature loss and to conserving and restoring ecosystems across its operations and value chain by 2030?</p> <p>1B How is nature integrated and positioned within the company's overall sustainability strategy?</p> <p>1C Has the company committed to reporting regularly on nature using frameworks such as TNFD?</p> | <p>1D Has the company disclosed commitments to reduce dependency on petrochemicals, virgin plastics, and other high impact materials, including through changes in product design, formulation, and delivery systems?—impact materials, including through changes in product design, formulation, and delivery systems?</p> <p>1E Has the company committed to eliminating or significantly reducing the production, use, or release of chemicals of highest concern for biodiversity (e.g. persistent, bioaccumulative, and toxic substances, including PFAS)?</p> |
|--|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|---|
| <ul style="list-style-type: none"> ● Does the company have Board-level or executive buy-in for its nature ambition, and is there evidence of a public commitment to this ambition? ● If no nature commitments exist, is the company willing to set one – and could this be linked to executive remuneration to signal ambition? ● How material does the company view nature-related issues in relation to its long-term strategy and financial performance? | <ul style="list-style-type: none"> ● How does the company balance growth objectives with commitments to phase-out or redesign high-impact products and processes, and what are the financial implications? |
|--|---|

2. Assessment

Companies need to assess and publicly disclose nature-related dependencies, impacts, risks, and opportunities at the operational level and throughout value chains.

Disclosure-based questions (from reports)

- | | |
|---|---|
| <p>2A Does the company disclose priority locations under TNFD for its direct operations and, where material, for upstream and downstream activities in its value chain?</p> <p>2B What proportion of the supply chain can the company trace (including Tier 1 suppliers and beyond), and what plans are in place to expand this scope if it is incomplete?</p> <p>2C [If relevant] Does the company assess and disclose its exposure to high-impact commodities (see SBTN High Impact Commodity List)?</p> <p>2D Has the company conducted nature-related impact and dependency assessments for its direct operations and value chain?</p> <p>2E What metrics does the company use to assess and manage material nature-related risks and opportunities?</p> <p>2F Has the company undertaken a nature-related risk scenario analysis? If so, what are the results?</p> | <p>2G Does the company disclose information about the sales of high risk / hazardous chemicals (i.e. those posing a significant threat to nature and/or human health)?</p> <p>2H To what extent does the company conduct site-level assessments of potential ecotoxic impacts associated with its manufacturing processes and products?</p> <p>2I What disclosures does the company provide regarding water use, pollutant releases to air, water and soil, and hazardous and non-hazardous waste generation?</p> <p>2J Does the company assess and disclose risks linked to cumulative and mixture effects of chemical releases, including persistence and long-range transport in ecosystems?</p> |
|---|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|--|
| <ul style="list-style-type: none"> ● What has the company identified as its most material nature dependencies and risks, and how do these link to financial risks? ● What proportion of significant operating sites have had nature-related risks assessed and monitored? ● What proportion of nature-related supply-chain risk remains unassessed or unreported, and how and when does the company plan to close those gaps? ● How does the company ensure nature risks are considered in capital allocation, product development, and long-term business resilience? | <ul style="list-style-type: none"> ● How does the company assess biodiversity risks associated with transitioning to alternative feedstocks (e.g. bio-based inputs, green hydrogen)? ● How does the company assess potential trade-offs (climate vs nature vs social) when considering transitioning to alternative feedstocks, energy sources, and/or production methods? |
|--|--|

3. Targets

Companies need to set time-bound, context-specific, science-based targets informed by risk assessments on nature-related dependencies, impacts, risks and opportunities, and disclose annual progress against targets.

Disclosure-based questions (from reports)

- | | |
|---|---|
| <p>3A Has the company published science-based targets on nature, with baselines, intermediary milestones, and transparent methodologies?</p> <p>3B Has the company published science-based targets to:</p> <ul style="list-style-type: none"> ● Reduce GHG emissions? ● Decrease water use and water pollution? ● Minimise the release of hazardous and priority substances to air, water and soil? ● Achieve deforestation- and conversion-free supply chains where relevant? ● Reduce hazardous waste generation and increase circular material use? <p>3C Has the company set time-bound targets for increasing sustainable sourcing and the use of lower-impact materials as part of a circular economy strategy?</p> <p>3D What targets has the company set in relation to supply-chain traceability?</p> | <p>3E Has the company set time-bound targets to reduce or phase out the production, use, or sale of chemicals of highest concern for biodiversity (e.g. persistent, bioaccumulative, and toxic substances, including PFAS), where technically and economically feasible?</p> <p>3F Has the company set targets to reduce total releases of hazardous chemicals to air, water, and soil across its direct operations, expressed in absolute terms rather than intensity-only metrics?</p> <p>3G Has the company set targets to reduce dependency on virgin fossil-based feedstocks, including petrochemicals, through increased use of recycled, circular, or lower-impact alternatives?</p> <p>3H Has the company established targets for reducing water pollution loads in priority or water-stressed locations, beyond compliance with local regulatory thresholds?</p> <p>3I Has the company set targets relating to product circularity (e.g. recyclability, reusability, or safe end-of-life treatment) for chemical products or materials placed on the market?</p> |
|---|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|--|
| <ul style="list-style-type: none"> ● How does the target-setting process for nature compare with the company's climate targets? ● How do nature targets link to employee incentives, procurement policies, or product portfolio decisions? ● What constraints are preventing the company from setting targets in particular areas, and how might these be overcome? ● To what extent are targets differentiated across subsectors or product lines with materially different biodiversity risk profiles? | <ul style="list-style-type: none"> ● How does the company balance potential trade-offs when setting targets for nature (vs climate and/or social) in relation to transitioning to alternative feedstocks, energy sources, and/or production methods? ● Which of the targets in the Global Chemical Framework (GFC) does the company regard as relevant to its business operations and value chain, and why? ● How is the company integrating the relevant GFC targets into its broader framework of nature targets? |
|--|--|

4. Implementation

Companies need to develop a company-wide plan on how to achieve targets. The design and implementation of the plan should prioritise rights-based approaches and be developed in collaboration with Indigenous Peoples and local communities when they are affected. Progress against the plan should be disclosed annually.

Disclosure-based questions (from reports)

- | | |
|--|---|
| <p>4A Does the company have a Nature Action Plan⁴⁹ linked to its impact and dependency assessments?</p> <p>4B Are the company's actions to reduce nature impacts prioritised according to the mitigation hierarchy?</p> <p>4C What investments, including CapEx, has the company made (and what is planned) to reduce its impact on nature and to protect or restore ecosystems?</p> <p>4D What is the company's strategy for managing water use, wastewater discharge, and pollution risks, particularly in water-stressed areas?</p> <p>4E What steps is the company taking to redesign products, formulations, or processes to reduce toxicity, persistence, and ecosystem harm?</p> <p>4F What systems are in place to engage suppliers on pollution control, water stewardship, and circularity?</p> | <p>4J How does the company ensure that transitions to alternative feedstocks (e.g. bio-based inputs or green hydrogen) do not create new biodiversity risks related to land use, water use, or pollution?</p> <p>4K What actions is the company taking to reduce downstream biodiversity impacts associated with the use, misuse, and disposal of its chemical products?</p> <p>4G What processes does the company use to identify, prioritise, and manage chemicals of concern within its product portfolio, including substitution or phase-out strategies?</p> <p>4H How does the company integrate "safe and sustainable by design" principles into product development, reformulation, and scale-up decisions?</p> <p>4I What measures are in place to prevent losses of chemicals and materials (e.g. pellets, powders, intermediates) during production, handling, transport, and storage?</p> |
|--|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|---|
| <ul style="list-style-type: none"> ● To what extent is nature risk management integrated into enterprise risk management and investment planning? ● What are the company's priority levers for implementation (e.g. technology, product redesign, partnerships, supplier engagement)? ● What are the main barriers to implementation, and how is the company addressing them? ● How does the company prioritise between substitution, redesign, and downstream controls when addressing high-risk chemicals? | <ul style="list-style-type: none"> ● How does the company validate that alternative chemicals or materials deliver a net biodiversity benefit over their full life cycle? ● How are suppliers engaged to ensure pollution reduction and safer chemistry extend beyond Tier 1, particularly in high-risk geographies? ● How does the company track and verify reductions in absolute pollution loads, rather than relying solely on intensity-based indicators? ● What internal governance or decision-making processes determine whether a product remains in the portfolio when biodiversity risks are identified? |
|--|---|

49. This demand will be updated with an ask for a Nature Transition Plan when more recommendations become available on the objectives and the structure of such a document.

5. Governance

Companies need to establish Board oversight⁵⁰ - which is key to ensuring biodiversity is embedded in strategic decisions and implementation - and disclose management's role in assessing and managing nature-related dependencies, impacts, risks, and opportunities.

Disclosure-based questions (from reports)

- | | |
|--|---|
| <p>5A What governance structures, policies, and procedures are in place to ensure the achievement of the company's nature commitments and targets, and the effective application of the company's nature strategy and risk management processes?</p> <p>5B Does the Board or a Board Committee oversee nature-related dependencies, impacts, risks, and opportunities?</p> | <p>5C To what extent is executive remuneration linked to sustainability KPIs related to pollution reduction, water stewardship, and safer product design?</p> <p>5D Does the company embed nature-related indicators or requirements for sustainability certification in procurement strategies and policies?</p> |
|--|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|---|
| <ul style="list-style-type: none"> ● How are nature-related issues reflected in Board discussions and decision-making? ● What is the current level of nature-related expertise in the C-suite and Board, and what plans are in place to maintain or increase this expertise? | <ul style="list-style-type: none"> ● How does the company ensure governance arrangements remain effective as regulatory expectations evolve? |
|--|---|

50. Board oversight involves the continual inquiry by directors into whether the board's delegation of authority to management is reasonable, and whether the board has received sufficient and accurate information from management to make that determination. See: <https://corpgov.law.harvard.edu/2022/01/05/board-oversight-key-focus-areas-for-2022/>

6. Engagement with Stakeholders

Companies need to engage with external parties, including actors throughout value chains, trade associations, policymakers, and other stakeholders, to create an enabling environment for implementing the plan and achieving targets.

Disclosure-based questions (from reports)

- | | |
|--|---|
| <p>6A Has the company published a sustainable procurement code or policy?</p> <p>6B To what extent does the company participate in collective programmes or industry alliances to reduce pollution, improve chemical safety, or strengthen water stewardship?</p> <p>6C To what extent does the company engage with stakeholders to create an enabling environment for implementing its Nature Action Plan and achieving the targets of the Global Biodiversity Framework?</p> | <p>6D What steps does the company take to ensure engagement with Indigenous Peoples and local communities where operations or sourcing affect land, water, or ecosystems?</p> <p>6E How does the company engage with policymakers and regulators to support stronger, science-based chemicals and pollution regulation?</p> |
|--|---|

Potential follow-up questions (for engagement interactions)

- | | |
|--|--|
| <ul style="list-style-type: none"> ● What barriers currently limit effective stakeholder engagement, and how is the company addressing them? ● What examples or case studies can the company provide to demonstrate effective collaboration with suppliers, customers, or regulators on biodiversity outcomes? ● How does the company ensure that its lobbying activities and trade-association memberships are aligned with its stated nature commitments? | <ul style="list-style-type: none"> ● What does the company require of its suppliers in terms of conducting site-level assessments of potential ecotoxic impacts associated with their manufacturing processes and products, and what support does it offer them? ● [If relevant] What is the company doing to encourage and support its agrichemical customers to avoid reduce their usage and avoid negative environmental impacts? ● [If relevant] What is the company doing to encourage and support downstream stakeholders to reduce single-use plastics in their business processes and find biodegradable and/or easily recyclable alternatives? |
|--|--|

50. Board oversight involves the continual inquiry by directors into whether the board's delegation of authority to management is reasonable, and whether the board has received sufficient and accurate information from management to make that determination. See: <https://corpgov.law.harvard.edu/2022/01/05/board-oversight-key-focus-areas-for-2022/>

Supporting Resources for Company Analysis

This section provides various supporting tools in the form of recommended resources and collaborative engagements covering issues in the sector, as well as sector-specific and cross-sectoral data sources. These supporting tools help to access more information and build further knowledge to mobilise when engaging with companies: examples of KPIs to monitor, additional resources, existing collaborative investor engagements on key topics for the sector, and data sources.

Recommended resources

We recommend the following resources to help investors gather more information about the sustainable transformation of the sector toward the protection of nature:

- [American Chemistry Council's Responsible Care Product Safety Code](#) sets out a commitment to a strong culture of product safety and product stewardship and provides a comprehensive framework to drive innovation and continual improvement. Implementation of this Product Safety Code is a requirement of all ACC Responsible Care companies.
- [The Biomass Budget](#): 2023 report published by ShareAction outlining the limitations of biomass as a raw material in the chemical sector. The report touches on the threat of bio-based feedstocks on biodiversity.
- [Chemicals Additional Sector Guidance](#) published by the TNFD: proposed core sector disclosure indicators and metrics.
- [Global Biodiversity Score Chemicals 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.
- [Global Framework on Chemicals](#) published by UNEP: The 'Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Waste' (GFC), adopted in 2023, presents a comprehensive plan to guide countries and stakeholders in jointly addressing the lifecycle of chemicals, including products and waste and their links to biodiversity loss and conservation.
The GFC's aim is to 'prevent or, where prevention is not feasible, minimise harm from chemicals and waste to protect the environment and human health'. It includes 28 targets, most of which have a 2030 deadline.
- [Global Product Strategy \(GPS\) Guidance on Chemical Risk Assessment](#) produced by the International Council of Chemical Associations (ICCA): GPS is part of the international chemical industry's voluntary
- [Responsible Care Global Charter](#). It commits companies to promote the safe use of chemical products and enhance product stewardship throughout the value chain.
- [Nature Positive: Role of the Chemical Sector](#) (WEF, 2024) summarises the sector's key impacts and dependencies on nature and sets out sector-specific actions that corporate leaders can start to take now to transform their businesses. The report is part of the World Economic Forum's 'Sector Transitions to Nature Positive' report series. The WEF initiative is part of a broader collaborative effort with Business for Nature and the World Business Council for Sustainable Development.

- [REACH Chemical Safety Assessments](#): The chemical safety report documents the chemical safety assessment undertaken as part of the REACH registration process, and is the key source from which the registrant provides information to all users of chemicals through the exposure scenarios. It also forms a basis for other REACH processes including substance evaluation, authorisation and restriction.
- [The Science Based Targets initiative \(SBTi\) – Chemical Sector Pathways and Implementation Criteria](#): designed to help companies in the sector set robust, science-based climate targets. The document provides pathways and calculation criteria for addressing several of the most significant sources of emissions in the sector, both direct and across the value chain.
- The [Science-based targets for Nature](#) has published guidance on [freshwater targets](#) covering freshwater use and freshwater pollution. The latter targets relate specifically to freshwater pollution resulting from nitrogen and phosphorus, so are mainly relevant to agrochemical producers in relation to chemical use by their customers. The SBTN plans to update these targets during 2026.
- [SDG Roadmap for the Chemical Sector](#) (published in 2018 by leading members of the [World Business Council for Sustainable Development \(WBCSD\) Chemicals Group](#), together with the American Chemistry Council (ACC) and Cefic (the European Chemical Industry Council)).
- Sigmund, G. et al. "[Addressing chemical pollution in biodiversity research](#)". Global Change Biology Journal Volume 29, Issue 12, pages 3240-3255.
- [SIN List](#) of hazardous chemicals that have been identified by ChemSec as being Substances of Very High Concern, based on the criteria defined within REACH, the EU chemicals legislation. These chemicals should be removed as soon as possible, as they pose a threat to human health and the environment.
- [Toxic Substances Control Act \(TSCA\) Work Plan for Chemical Assessments](#): issued by US EPA in October 2014 to reflect on data submitted to EPA by the chemical industry on chemical releases and potential exposures.

Collaborative investor engagements covering issues in the sector

In its [Guide on Engagement with Companies](#), the FfB Foundation built an overview of biodiversity-related collaborative engagements, to help investors discover engagement initiatives relating to the chemicals sector that they can join.

- IEHN & Mercy Investment Services: [IEHN Working Group for Pesticide Reduction and Biodiversity](#)
- ChemSec: [Investor Initiative on Hazardous Chemicals](#) - The 75+ investors in this group are calling on the chemical manufacturers to improve transparency by disclosing the names and share of revenue of the hazardous chemicals they manufacture globally, for a phase out of persistent chemicals, reduction of hazardous portfolio and the development of safer alternatives.
- ShareAction:
 - [Investor engagement campaign on the Pesticides industry](#) - ShareAction's pesticides campaign aims to leverage investor power to address the immense risks to biodiversity posed by the pesticides industry.
 - [Chemicals and Biodiversity Investor Statements 2025](#): A collaborative effort to produce investor statements directed towards the chemical industry and the governments represented in the Global Framework on Chemicals and the Global Biodiversity Framework.
- Ceres: [Valuing Water Finance Initiative](#) - The Valuing Water Finance Initiative is a global investor-led effort to engage companies with a high water footprint to value and act on water as a financial risk and drive the necessary large-scale change to better protect water systems.
- [FAIRR Initiative](#): The Farm Animal Investment Risk and Return (FAIRR) Initiative is an investor network that aims to put factory farming on the ESG agenda. They deal with a plethora of issues, including the use of chemicals in livestock and arable farming.

Sector-relevant sustainability initiatives

When assessing companies in the sector, investors can also refer to various sustainability initiatives that are relevant for companies in the Chemical sector. These not only demonstrate what is already happening within and among companies in the sector, but also show the level of ambition that is needed from the companies that investors are engaging with to effectively halt and reverse nature loss.

- [Global Impact Coalition](#): a CEO-led chemical industry coalition that focuses on accelerating the development and upscaling of low-carbon emitting technologies in chemical production and related value chains.
- Responsible Care: 'the global chemical industry's voluntary initiative to drive continuous improvement in safe chemicals management and achieve excellence in environmental, health, safety and security performance.' Responsible Care® promotes the [Responsible Care® Global Charter](#) which outlines a common global vision to improve the environmental, health and safety performance of chemical producers by uniting the commitment of more than 747 CEOs, representing more than 90 percent of the world's top 100 petrochemical and chemical manufacturers.

- [Together for Sustainability \(TfS\)](#): TfS is a member-led initiative of major chemical companies representing a global turnover of €800 billion, working to accelerate the development of sustainable and resilient chemical supply chains.
- [World Business Council for Sustainable Development \(WBCSD\) Chemicals Group](#): the WBCSD Chemicals Group supports its members in advancing their ambitions on the [SDG Roadmap for the Chemical Sector](#) (published in 2018 by leading group members, together with the American Chemistry Council (ACC) and Cefic (the European Chemical Industry Council)).
- The [CEO Water Mandate](#) seeks to mobilise a critical mass of business leaders to address global water challenges through corporate water stewardship, notably through the [Water Resilience by 2050 Pledge](#).

Sector-specific and cross-sectoral data

Investors looking for data specific to the Chemicals Sector can turn to the following sources:

- [ChemScore](#) is ranking the world's top 50 chemical producers on their work to reduce their chemical footprint.
- Planet Tracker [Toxic Footprints Europe](#) shows how investors are exposed to petrochemical facilities and their toxic releases in three European countries – Belgium, the Netherlands, and Germany.
- ZSL [SPOTT Benchmark](#) assesses palm oil, rubber, pulp & timber producers, processors, traders and manufacturers on their public disclosure regarding their organisation, policies and practices related to environmental, social and governance (ESG) issues.

For cross-sector information, we recommend turning to the following data sources:

- [Aqueduct Water Risk Atlas tool](#) - Managed by the World Resources Institute, Aqueduct's tools use open-source, peer-reviewed data to map water risks such as floods, droughts, and stress. It helps to analyse water risks and identify activities that withdraw and consume water in locations with very high baseline water stress.
- [CDP](#) (Forest, Land, Water) provides companies, investors, states, and regions with opportunities to measure and manage their nature-related dependencies, impacts, risks, and opportunities. Companies can [disclose their environmental data](#) and investors can [sign up](#) to request this data.
- [Forest 500](#) by Global Canopy ranks the 500 ranking the most influential companies driving tropical deforestation.
- Exploring Natural Capital Opportunities, Risks and Exposure ([ENCORE](#)) is a free, online tool that helps organisations explore their exposure to nature-related risk and take the first steps to understand their dependencies and impacts on nature.
- The Global Biodiversity Information Facility ([GBIF](#)) is an international network and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth.
- [IBAT Alliance](#) – the Integrated Biodiversity Assessment Tool (IBAT) provides authoritative geographic information about global biodiversity.
- The [SBTN Natural Lands Map](#) of “Core Natural Lands” is intended to be used in the Science Based Targets Network target on “no conversion of natural ecosystems”.

- [WWF Biodiversity Risk Filter](#) - Corporate and portfolio-level screening tool to help companies and investors prioritise action on what and where it matters the most to address biodiversity risks.
- WWF [Water Risk Filter](#) - Corporate and portfolio-level screening tool to help companies and investors prioritise action on what and where it matters the most to address water risks.
- WBCSD's [Nature Action Portal](#) – designed to help 'sustainability practitioners identify the most relevant metrics to measure and report on actions to halt and reverse nature loss, in alignment with major voluntary and regulatory frameworks. By facilitating access to a prioritised set of metrics, the Portal aims to accelerate corporate action and accountability on nature and drive investment to solutions that make the most significant progress on the societal goal of halting and reversing nature loss by 2030'.⁵¹

51. <https://www.wbcsd.org/resources/harmonizing-the-use-of-nature-related-metrics-by-corporations/>

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Original version

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Expert review

This Chemicals Sector Brief has been reviewed by a number of experts including Adam Rose (IIGCC), Graham Hamley (Ceres), Laura Fisher (WEF), Titouan Barbier (Arkea Asset Management), and Tom Hegarty (TNFD), and some who wished to remain anonymous. We are very grateful for their feedback.

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This publication is one of the many practical guides developed by the Finance for Biodiversity (FfB) Foundation in collaboration with its members, to support financial institutions on their journey towards fully integrating nature into their businesses. FfB Foundation membership allows financial institutions to take part in our active working groups which bring together leading banks, investors and insurers to independently share perspectives and best practices. The many guidance documents we produce are the result of these collaborations. We welcome all financial institutions to join the Foundation and fast track alignment of their financial activities and investments with nature recovery. There are now two options to work with us: membership and Hub participation. Visit [Finance for Biodiversity Foundation | Join us](#) to find out more.

Appendix 1

ENCORE Impacts Database – Chemicals

ENCORE uses the ISIC system which breaks the Chemicals sector into five ISIC Groups involving the manufacture of: man-made fibres; 'other chemical products'; basic chemicals; plastics and synthetic rubber in primary forms; and fertilisers and nitrogen compounds. Below are listed the main impacts and dependencies by ecosystem services identified in [ENCORE](#) for the manufacturing of chemicals and chemical products where ENCORE awards high or very high materiality ratings (lower ratings are not included).

1. ENCORE Impacts Database – Manufacture of chemicals and chemical products

Disturbances (e.g. noise and light pollution): VERY HIGH

- The manufacture of chemicals can cause disturbances like noise and light pollution due to the operation of machinery and the need for adequate lighting in production areas. This can disrupt or negatively affect species populations, for example by altering migration patterns.
- ENCORE rates the manufacture of man-made fibres as MEDIUM; all the other ISIC Groups are rated as VERY HIGH.

Volume of Water Use: HIGH

- Manufacturing processes require large volumes of water for cooling reactors and other equipment, processing raw materials, and surface washing. Water abstraction can reduce local water supplies, which can increase the risk of drought and impact ecological habitats.
- Significant amounts of water are used for pelleting, cooling and gas quenching.
- Water is used in cooling, washing and boiler blow down in various aspects of the production process. Large-scale water abstraction from groundwater aquifers can contribute to increasing likelihood and/or severity of droughts.
- This rating only applies to the manufacture of plastics and synthetic rubber. All the other ISIC Groups are rated MEDIUM.

Emissions of toxic pollutants to water and soil: VERY HIGH

- Catalytic cracking processes, manufacture of synthetic rubber, and dilute aqueous caustic scrubs used in production, can result in wastewater being polluted with toxic and harmful chemicals such as sulphur, nickel, ethylbenzene, ethylene oxide and benzene, which can also contaminate nearby soils.
- ENCORE rates the manufacture of man-made fibres as MEDIUM; all the other ISIC Groups are rated as VERY HIGH.

Emissions of nutrient pollutants to water and soil: **VERY HIGH**

- Manufacture of fertilisers and nitrogen can lead to an excess of nitrogen getting into the environment, often filtering into aquatic ecosystems. Once there, it can cause a rapid increase of toxic algae, known as algal blooms, which deplete oxygen in water and can create coastal dead zones affecting underwater life. Water containing elevated levels of nitrate raises the risk of water being drinkable. Nitrogen pollution causes nitrogen-tolerant species to thrive and outcompete more sensitive wild plants and fungi. This reduces wildlife diversity and damages plant health.
- The other ISIC Groups are not rated by ENCORE for this impact.

2. ENCORE Dependencies Database - Manufacture of fertilisers and nitrogen compounds

Water Supply: **HIGH**

- Water supply services reflect the combined ecosystem contributions of water flow regulation, water purification, and other ecosystem services to the supply of water of appropriate quality to users for various uses including household consumption. This is a final ecosystem service.
- This rating only applies to the manufacture of fertilisers and nitrogen compounds. All the other ISIC Groups are rated MEDIUM.

Water Flow Regulation: **HIGH**

- Baseline flow maintenance services are the ecosystem contributions to the regulation of river flows and groundwater and lake water tables. They are derived from the ability of ecosystems to absorb and store water, and gradually release water during dry seasons or periods through evapotranspiration and hence secure a regular flow of water. This may be recorded as a final or intermediate ecosystem service. Peak flow mitigation services are the ecosystem contributions to the regulation of river flows and groundwater and lake water tables. They are derived from the ability of ecosystems to absorb and store water, and hence mitigate the effects of flood and other extreme water-related events. Peak flow mitigation services will be supplied together with river flood mitigation services in providing the benefit of flood protection. This is a final ecosystem service.
- This rating only applies to the manufacture of fertilisers and nitrogen compounds. All the other ISIC Groups are rated MEDIUM.

Appendix 2

Comparing different economic classification systems

Global Industry Classification Standard ⁵² (GICS) Level 3	151010 – Chemicals
International Standard Industrial Classification ⁵³ (ISIC)	2011 – Manufacture of basic chemicals 2012 – Manufacture of fertilisers and nitrogen compounds 2021 – Manufacture of pesticides and other agrochemical products 2022 – Manufacture of paints, varnishes, printing inks, and mastics 2023 – Manufacture of soap, detergents, cleaning preparations, perfumes, and toilet preparations 2029 – Manufacture of other chemical products not elsewhere classified 2030 – Manufacture of man-made fibres
Nomenclature of Economic Activities ⁵⁴ (NACE)	C20 – Manufacture of Chemicals and Chemical Products
Sustainable Industry Classification System ⁵⁵ (SICS)	Chemicals

Table 5: Classification and scope of the Chemicals sector

Investors generally use the [Global Industry Classification Standard](#)⁵⁶ (GICS) to manage and track the progress of the companies in their portfolio as well as determine which specific type of activities the companies in their portfolio are involved in.

The ISIC system⁵⁷ is used by a number of tools that help organisations explore their exposure to nature-related risk and take the first steps to understand their dependencies and impacts on nature such as the Science Based Targets Network (SBTN) [Materiality Screening Tool](#) (MST)⁵⁸ and ENCORE.⁵⁹

The NACE system⁶⁰ is frequently used by governments and other related organisations, when classifying economic activities.

The Sustainable Industry Classification System (SICS)⁶¹ was developed by the Sustainable Accounting Standards Board (SASB), now incorporated into the International Sustainability Standards Board (ISSB). It is used by the Nature Action 100 investor initiative to group the companies that it focuses on into eight sectors.

52. The Global Industry Classification Standard (GICS) is an [industry taxonomy](#) developed in 1999 by [MSCI](#) and [Standard & Poor's](#) (S&P) for use by the global financial community.

53. The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities.

54. The Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE, is the [industry standard classification system](#) used in the European Union.

55. SASB Standards use the Sustainable Industry Classification System® (SICS®) to group companies based on shared sustainability risks and opportunities.

56. The Global Industry Classification Standard (GICS) is an [industry taxonomy](#) developed in 1999 by [MSCI](#) and [Standard & Poor's](#) (S&P) for use by the global financial community.

57. The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities.

58. The SBTN's MST is designed to help users carry out a first screening of the types of environmental impacts that are potentially materially relevant to the direct and upstream operations of a sector and a company's activities

59. ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a free, online tool that sets out how the economy – sectors, subsectors and production processes – depends and impacts on nature.

60. The Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE, is the [industry standard classification system](#) used in the EU.

61. SICS uses sustainability profiles to group similar companies within industries and sectors. In SICS, a company's sustainability risks and opportunities are more important for its classification than other traditional factors, such as economic cycles and revenue streams

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