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AXA WE ACT Biodiversity

Impact Report 2022

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Executive Summary

In this inaugural annual impact report for AXA WF ACT Biodiversity, we aim to illustrate the positive contribution of the companies we invested in across our four biodiversity impact themes; Land & Animal Preservation, Water Ecosystem, Sustainable Materials and Recycling & Recirculation.

For each company held in the portfolio as of 31 December 2022, we have provided a brief explanation of the impact we believe that company has had on the relevant biodiversity theme, and we intend to track the progress of each company's impact in our future annual impact reports. In addition, for each of the fourteen sub-themes which underpin our four overarching biodiversity themes, we have provided a company case study, intended to add additional context on the issues we are aiming to tackle through our investments, as well as explain how each company is addressing the issue at hand through their products and services. The structure we have used in these case studies was designed around the concept of the theory of change, which we have adopted based on our experience of working with the Global Impact Investing Network (GIIN).

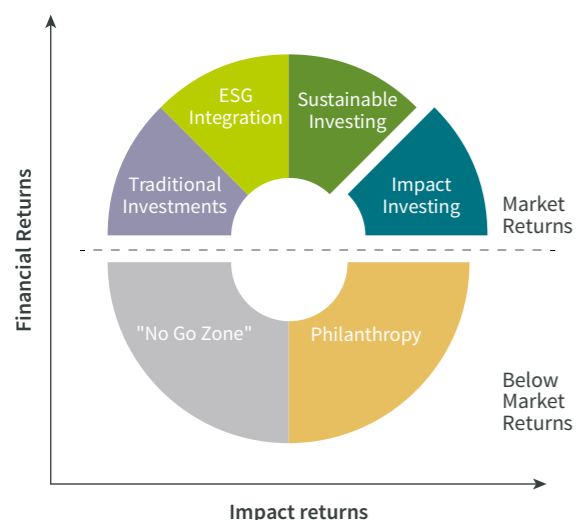
We have also provided a theory of change at the overall strategy level, and aggregated data from the companies we invest in to provide overall portfolio-level key performance indicators. The portfolio's contribution towards the UN Sustainable Development Goals is also provided, and is based on the underlying contribution of each company's products and services.

We hope this report provides valuable insight into how the companies we are investing in are contributing to the goal of having a positive impact on biodiversity. We are fully committed to enhancing this report over the coming years and increasing visibility of the contribution of our strategy and underlying investments.

Introduction

Impact investing is emerging as a powerful way of delivering financial returns while also tackling the world’s biggest societal challenges.

While ESG (Environmental, Social and Governance) Integrated strategies are focused on reducing ESG risks, impact investing aims to target companies with operational structures and/or products and services which provide a positive impact on society.



The roots of impact investing have been in venture capital and private equity. But over recent years the concept has evolved to include listed equities and fixed-income markets, accelerated by the 2030 Agenda for Sustainable Development, which sets priorities for a more sustainable economy and was adopted by all United Nations Member States in 2015. Since then, the size of the impact market has increased significantly, reaching the symbolic threshold of 1 trillion dollars in 2021, based on an estimation of the Global Impact Investing Network (GIIN).

The UN Sustainable Development Goals (“SDGs”) provide a plan of action to companies, investors and citizens to collaboratively address key global challenges including poverty, inequality, climate and health; redefining their roles and impact on society.

The UN SDGs provide a plan of action for companies and investors

The UN SDG financing gap reached \$3.9 trillion dollars after the covid-19 pandemic, versus a previous gap of \$2.5 trillion dollars¹, as the global pandemic has generated additional financing needs but has also decreased available investment. To fully achieve these objectives by 2030, governments, regulators, consumers and investors will have to work together and direct capital flows towards initiatives that promote sustainability and make a positive impact on society.

The financing gap to achieve the SDG ambition could reach \$4.3tn per year from 2020 to 2025



AXA IM’s impact research framework for listed equities

Impact investors have a key role to play to accelerate positive change. Industry standards emerged to re-orient capital flows and have been adapted over the years to be more flexible and inclusive. However, it is not possible to replicate traditional impact investing concepts in listed equities due to asset class specific issues such as complexity of investees (which may have diversified business models and geographic footprints), access to data, and liquidity and fluidity of the market.

As work to define a common and globally recognized framework for impact investing is still in progress, at AXA IM we have chosen to develop our own [impact research framework for listed equities](#). As a member of the advisory committee of the Global Impact Investing Network (GIIN), AXA IM contributed to the [Guidance for Pursuing Impact in Listed Equities](#) published in March 2023. Our impact investment analysts use this proprietary impact research framework to assess the contributions of companies to environmental and/or social objectives and the United Nations’ Sustainable Development Goals. This framework is based on 5 pillars which are specific to impact investing and is used by our impact funds to identify companies contributing to pre-defined funds’ targeted impact objectives.

- INTENTIONALITY** Our research seeks to identify companies that demonstrate intentional, strategic commitment to generate positive impact in social or environmental areas.
- MATERIALITY** We seek to identify companies offering solutions with positive outcomes that are of material significance to the beneficiaries and are also important for the company. We pay attention to the proportion of a company’s revenues that align with the SDGs or the EU taxonomy. We also consider a variety of other factors, such as the severity of the issue being addressed, the number of beneficiaries (particularly among underserved people), and the extent to which a firm is a leading solutions provider relative to its peers.
- ADDITIONALITY** Our research seeks to identify companies offering the best and most accessible solutions, for example through innovation, new technologies, lower prices, or better distribution. We also assess the extent to which corporate practices, behaviour and operations are leading, influencing and shaping others’ approaches.
- NEGATIVE EXTERNALITIES** We assess how companies are addressing the negative externalities of their activities which may undermine their positive impact.
- MEASURABILITY** We expect companies to measure and report data and KPIs on the social and environmental impact of their activities. Impact is more difficult to measure than environmental, social and governance (ESG) factors because of the lower degree of data availability and standardisation. We often encourage companies to enhance their impact reporting and we track the evolution of these KPIs.

Through our research, we seek to identify ‘Impact Leaders’, which are the highest rated companies in terms of delivering positive societal impact. We typically focus on companies that sell goods and services of critical importance and generate significant additionality by leveraging technology, scale or innovation to make goods and services accessible and commercially viable in potentially underserved markets.

We believe our in-depth impact research, when integrated into our traditional company and financial analysis, is a powerful tool to identify potential long-term winners, which can enjoy a self-reinforcing relationship between generating impact and financial outcomes.

¹ Source: OECD [Global Outlook on Financing for Sustainable Development 2023: No Sustainability Without Equity](#) | en | OECD

Act for the environment by protecting natural capital and reducing biodiversity loss

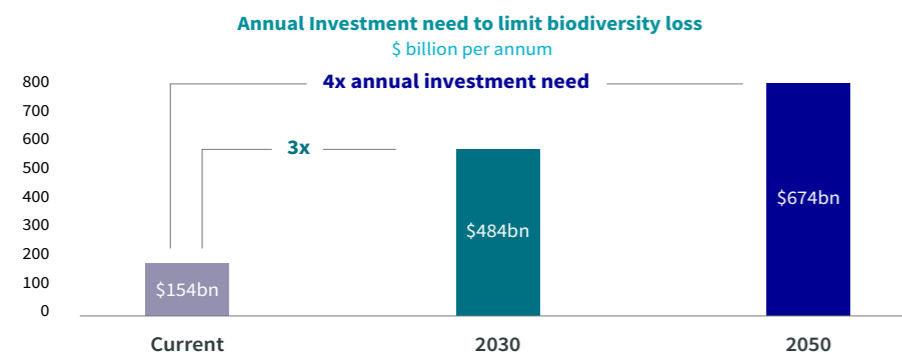
A theory of Change for AXA IM Biodiversity impact strategy

The AXA IM Biodiversity strategy has a dual objective of seeking to deliver long-term financial returns while investing in companies that deliver a positive and measurable impact on biodiversity. The strategy invests in companies that have demonstrated a positive and measurable impact across 4 key biodiversity themes; Land & Animal Preservation, Water Ecosystem, Sustainable Materials and Recycling & Recirculation. We select companies that can demonstrably create environmental value, and are effectively preserving life on land, water and air, mainly through providing sustainable alternative and innovative products and services which are protecting and supporting ecosystem preservation. Every company in our portfolio demonstrates a positive contribution towards at least one of the five targeted environmental UN SDGs.

Impact Context

The latest Living Planet Report reveals global wildlife populations have plummeted by 69% on average over the past 50 years while human population has increased by 107%. The climate and nature crisis is not only an environmental issue, but socio-economic crisis too. We have recently seen good progress made at COP 15, one of the biggest conferences on biodiversity where 190 countries agreed to a new set

of goals and targets to “halt and reverse” biodiversity loss by the end of the decade. The agreement reached is seen as an equivalent to the 2015 Paris Agreement for climate. However, while we need to accelerate investment to limit climate change to below 1.5°C warming, the goal of halting biodiversity loss and land degradation needs investment four times higher than current levels, a much larger jump in magnitude.



Source : State finance nature.pdf (unep.org)



Our Strategy

The AXA IM Biodiversity strategy’s main impact goal is to support the reduction of biodiversity loss and preservation of natural ecosystems and resources and therefore seeks to invest in companies we believe are effectively preserving life on land, water and air through providing sustainable alternative products and services. We have identified four key investment themes (outlined on the right), which we believe align well with the Biodiversity related UN SDGs, and will be key drivers of biodiversity over the coming years.

Our strategy invests into listed companies that make a direct contribution to these themes, mainly through the products and services they offer (this defines the companies’ ‘investee contribution’). For each company, we aim to identify these companies through a proprietary impact research framework based on five key pillars; Intentionality, Materiality, Additionality, Negative Externalities



and Measurability. We identify and track a range of key performance indicators (“KPIs”) which allows us to measure the societal contribution of companies and the progression of such contributions over time.

Portfolio Structure

Our strategy invests in companies across different market capitalisations and industries that demonstrate a clear contribution to one of the five targeted biodiversity-related UN SDGs – 2 (zero hunger), 6 (clean water and sanitation), 12 (responsible consumption and production), 14 (life below water) and 15 (life on land) – mainly through their products and services.

As such, our strategy is inherently biased towards small and mid-cap companies as we find numerous companies with potentially disruptive, innovative solutions and attractive risk/return profiles within this part of the market. Furthermore, the focus on products & services» drive inherent geographical and sectoral exposures. For example, biodiversity awareness currently is most advanced in Europe,

mainly driven by regulation, and thus we see an abundance of investable opportunities in this region. Similarly, many packaging companies providing alternatives to fossil-fuel plastics are classified by the GICS classification within the Materials sector while water treatment or recycling names addressing water and land pollution are classified within the Industrials sector. These explain the portfolio’s overweight position to these two sectors while being underweight to other sectors such as Technology and Financials.

Investor Contribution

The theory of change – actions to achieve a desired change – is at the heart of impact investing. However, practices for delivering and demonstrating impact through public markets vary compared to private markets, as described in the GIIN’s [Guidance for Pursuing Impact in Listed Equities](#).

While the strategy targets positive impact through investment in

Wildlife population has plummeted by 69% while human population has increased by 107%

companies which are creating biodiversity value, mainly through the products and services they offer, we also use shareholder engagement and voting activities as tools to support companies’ in meeting our targeted UN SDGs.

Active engagement is focused on a selection of companies where we believe our involvement will have a material impact in achieving predefined impact targets, and is centered around a number of key themes such as Resources & Ecosystems and Climate Change. We also engage around Sustainable Development Goals and drive impact through the utilisation of our shareholder rights urging companies to contribute to global sustainability related targets. Importantly, we also aim to motivate companies to enhance their Impact KPIs disclosure through engagement, which helps us to judge which companies are making progress towards our targeted impact goals.

Furthermore, while investing in listed equities does not typically directly provide new capital, remaining as long-term investors in small- and mid-cap companies which are generating societal value provides greater stability to their share price. This in turn enables the company to pursue other capital market operations, which may further increase their impact. We therefore aim to maintain positions over, on average, a 3 – 5 year horizon, as long as the company remains compatible with the overall objectives and requirements of our portfolio. Maintaining a long-term investment horizon also enables us to carry out effective and worthwhile engagement with individual companies.

Portfolio Highlights 2022

Key Performance Indicators at an aggregated portfolio level



28m tonnes

Of waste reused

Darling Ingredients, Smurfit Kappa, Verallia, Stora Enso, Mondi



16m tonnes

Of waste avoided

Veolia, Republic Services, Befesa



244bn m³

Of water treated

Evoqua Water, Danaher, Veolia, China Everbright



1bn m³

Of water saved for customers

Ecolab, Valmont Industries



493k hectares

Of forest area set aside for conservation

Stora Enso, UPM-Kymmene, Mondi, Smurfit Kappa



3m hectares

Of forest area certified as sustainably managed

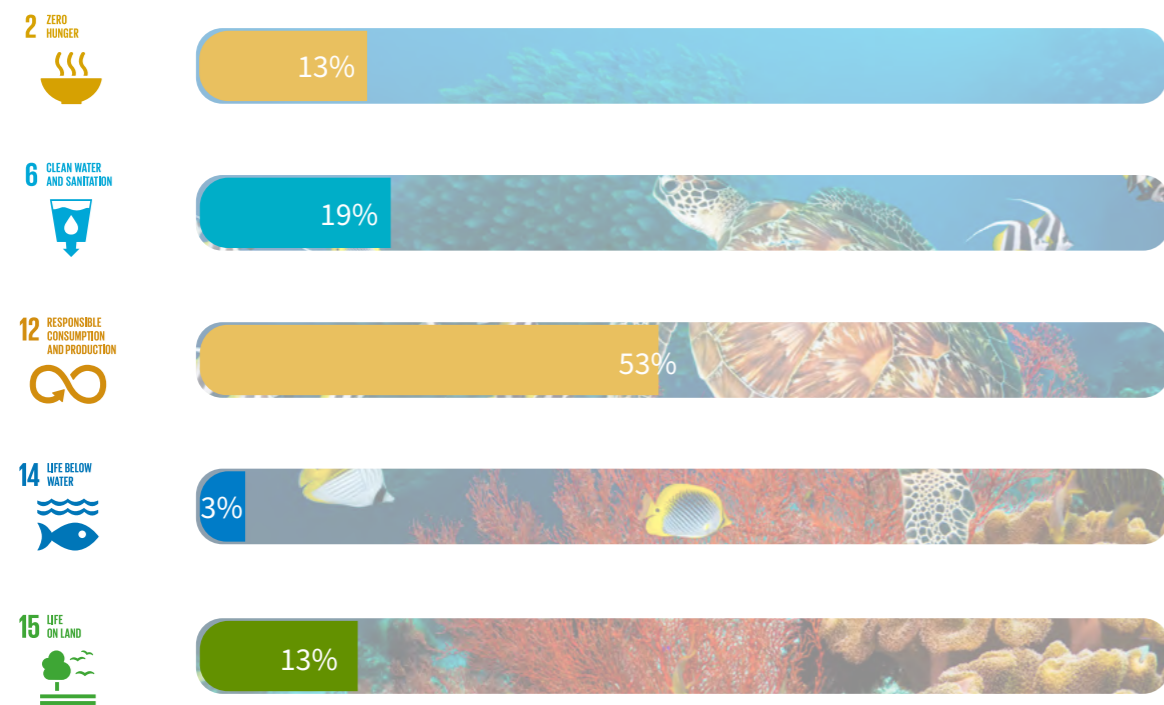
Stora Enso, UPM-Kymmene, Mondi, Smurfit Kappa

Aggregated portfolio KPIs are calculated by aggregating data for those companies where 1) we have been able to gather KPI data for 2022, and 2) the company is held in the portfolio as of December 2022 and contributes in a relevant way for that particular KPI. Aggregated impact data aims to provide an indication of the overall impact of the underlying companies held in the portfolio, in some cases underlying assumptions and adjustments have been made given individual companies measure and report using different methodologies.



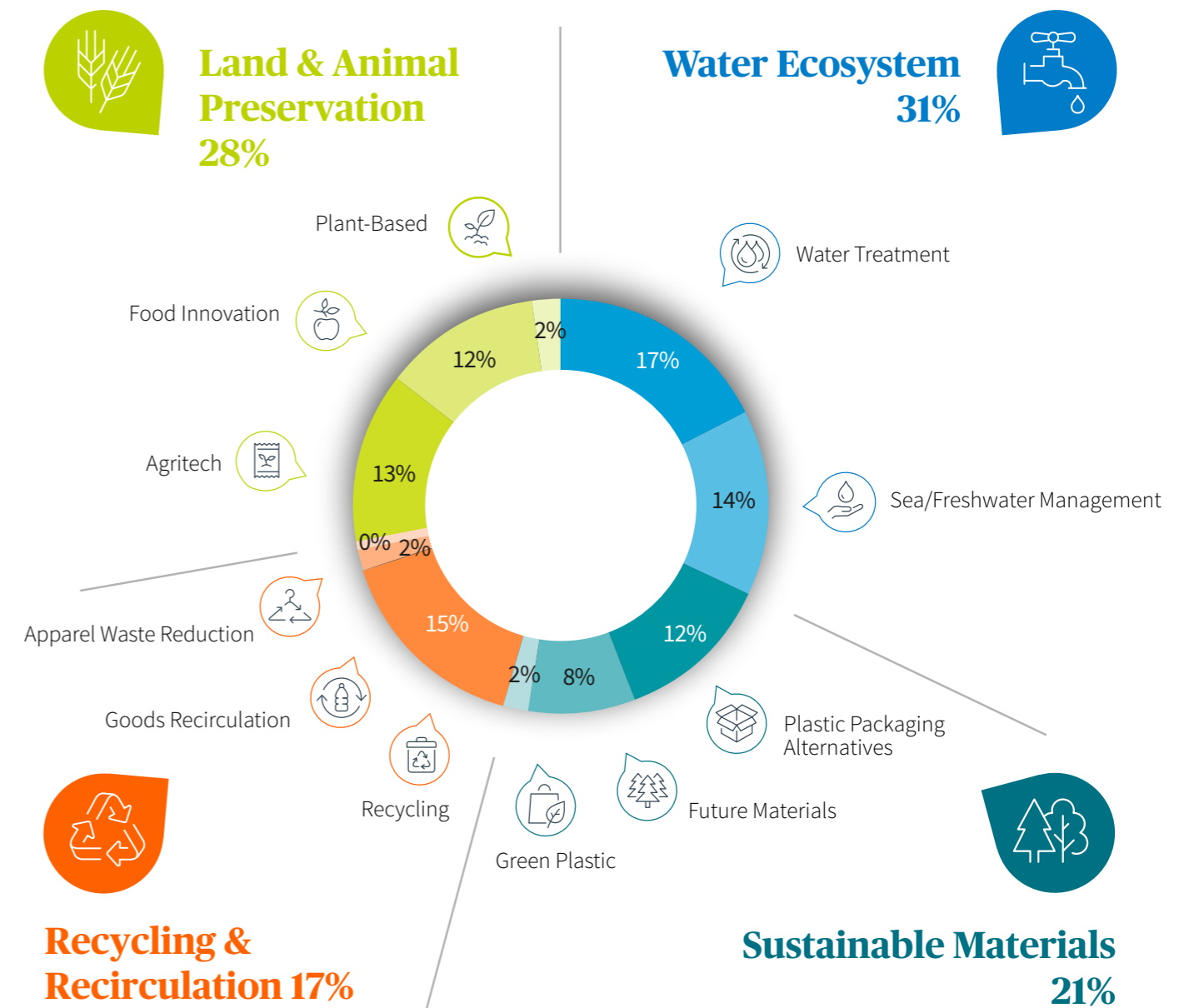
Portfolio characteristics

Contribution to targeted UN SDGs



Portfolio characteristics

Thematic exposure



Source: AXA IM as at 31/12/2022. For illustrative purposes only. No assurance can be given that the strategy will be successful or that investors will not lose some or all of their capital. Past positioning is not indicative of future positioning. SDG contribution methodology: each company is assigned a primary and secondary by our Impact analysts.

Source: AXA IM as at 31/12/2022. For illustrative purposes only. Totals may not add up due to rounding. No assurance can be given that the strategy will be successful or that investors will not lose some or all of their capital. Past positioning is not indicative of future positioning.



Land & Animal Preservation

Agritech



Food Innovation



Plant-Based



Agritech

Case Study: Valmont

To us, the agriculture sector is to biodiversity what the energy sector is to climate change, namely its biggest challenge. Change in land use is mainly due to increasing demand for agricultural land. The sector is responsible for 80% of deforestation and uses 50% of all habitable land, while one third of all food produced is wasted. Furthermore, agriculture represents 70% of all freshwater usage and it is estimated that more than half of it is wasted due to leaky irrigation systems or inefficient application methods. Intensive groundwater abstraction for irrigation depletes aquifers, which can take decades or centuries to regenerate. In addition, agriculture remains a major source of water pollution (from fertiliser and pesticide run-off, and livestock effluents). Increasing the overall water efficiency of the agricultural sector is crucial to reduce the sector's impact on freshwater resources and improve its resilience to water-related risks.



Inputs

11,000 Employees



Activities

Valmont manufactures and distributes mechanical irrigation equipment (especially center pivots) powered by electricity and related service parts under the "Valley" brand name.



Outputs

In center pivots, sprinklers are attached to a pipeline that is supported by a series of towers, each of which is propelled via a drive train and tires. Valmont's remote management capabilities allow farmers to control pivots and a variety of other farm equipment on any web connected device to assist in reducing water and energy use. Valmont's crop anomaly detection system can alert growers of sub-optimal water usages using artificial intelligence and machine learning to determine where and how much to irrigate.



Outcome

Valmont reports 30m acres being irrigated by more than 228k of Valmont's pivots globally and claims its center pivots can generate 40% water saving compared to traditional irrigation methods. Similarly, the company estimates farmers save 27k tonnes of CO2 annually by using its remote-connected irrigation devices.



Impact

Valmont contributes mainly to SDG 6 through its irrigation systems which allow farmers to increase efficiency in water use.

Portfolio Weight: 2.4%

KPI: Estimated amount of water saved by Valmont's pivots sold each year, 379bn litres



Food Innovation

Case Study: DSM

Global food systems are facing interconnected environmental and social challenges. They are crucial to the health and well-being of people and animals, and are simultaneously negatively impacted by climate change as well as contributing to it. Furthermore, consumers are becoming more cautious of the nutritional profile of the food they eat and of its environmental footprint. Consequently, there is growing demand for dietary supplements, natural ingredients, and plant-based food.



Inputs

R&D spend was circa EUR 323m in 2021



Activities

DSM is a Dutch science-based company providing diverse products including animal nutrition.



Outputs

DSM is one of the world's leading producers of animal nutrition and health products. Its products include those essential to animals' healthy development such as core vitamins, premixes and carotenoids, and products improving farming efficiency such as enzymes, microbes and eubiotics that combat mycotoxins, tackle antimicrobial resistance and optimize gut health, feed conversion and feed efficiency (which contributes to reduce related GHG emissions).



Outcome

Many of DSM's products have a positive social and environmental impact as they reduce the environmental impact of animal farming and improve farmers' productivity.



Impact

DSM's P&S have significant materiality as they are widely used in animal farming, food and nutrient production (SDG 2). Furthermore, its products help to reduce the environmental impact of animal farming (SDG 12).

Portfolio Weight: 3.9%

KPI: Innovation sales as a % of total sales, 19%.



Plant-Based

Case Study: Lenzing

The fashion and garment industry’s environmental footprint has grown considerably, notably as societies have tended to overconsume clothing and apparel. Nearly 20% of global waste water is produced by the fashion industry, while around 73% of clothing is disposed of in landfills. Moreover, around 70% of an apparel item’s environmental footprint comes from its production. Given heightened consumer awareness regarding the detrimental impact of the fashion industry on the environment, companies are moving towards cleaner production methods. This is leading to changes in the composition of garments, towards more resource-efficient, circular, and environmentally-friendly raw materials.



Inputs

8,301 Employees
EUR 34.8 Mn R&D Spending



Activities

Lenzing is an Austrian company that produces wood-based cellulosic fibres and textiles. Lenzing’s high quality fibres compete in particular with textile uses usually relying on synthetic polymer fibres for their advanced properties, notably in sportswear.



Outputs

In 2022, around 82% of Lenzing’s revenues were derived from the sale of wood-based fibres, while 18% of revenues were derived from the sale of pulp to other textile and fibre manufacturers.



Outcome

Via its range of cellulosic fibres, Lenzing provides more sustainable alternatives to synthetic fibres, but also to resource-intensive and polluting natural fibres such as cotton. Lenzing’s R&D focus on using recycled content also contributes to repurposing used textiles and cutting scraps, contributing to better circularity in the industry.



Impact

Lenzing’s sustainable alternative materials are more environmentally friendly compared to petroleum-derived synthetic fibres and cotton, which are associated with larger land and water footprints. Lenzing’s high quality wood-based fibres are aligned with a garment consumption model that re-focuses on quality over quantity.

Portfolio Weight: 0.7%

KPI: GHG Emission Intensity of Lenzing’s Fibres (scope 1, 2 & 3), 3.1 t CO2e/t sold



A list of other companies contributing towards Land & Animal Preservation within AXA IM Biodiversity is provided below, portfolio weights are as at 31/12/2022.

Company, Country, Sector	Contribution to Land & Animal Preservation	UN SDG Contribution
Sub Theme: Agritech		
Deere & Co US, Industrials Portfolio Weight: 5.3%	Deere manufactures and distributes a range of agricultural, construction, forestry, and commercial and consumer equipment. They have significant additionality as they enable farmers to reduce their costs and environmental impact through technology-enabled input efficiencies.	2, 12, 15
Trimble US, Information Technology Portfolio Weight: 3.0%	Trimble provides positioning technology solutions such as GPS-based applications to a range of customers including farmers. Trimble GPS solutions have the potential to increase productivity while reducing the environmental impact (such as enabling reduction of water use) of large, carbon-intensive industries such as construction, agriculture and transportation.	12, 2, 15
Kubota Corporation Japan, Industrials Portfolio Weight: 2.7%	Kubota is a global machinery manufacturer. Kubota commits to increase the agricultural productivity and ensure sustainable food production systems through resilient agricultural practices	2, 6
Sub Theme: Food Innovation		
Kerry Group Ireland, Consumer Staples Portfolio Weight: 2.9%	Kerry is a leader in the manufacture of ingredients for food production. Kerry may play an active role in promoting, marketing and innovating towards a healthier food system for both society and the environment. Kerry’s taste and nutrition solutions may mitigate the unhealthy attributes of processed foods, without changing the taste and texture qualities of dishes.	12, 2
Croda International UK, Materials Portfolio Weight: 2.8%	Croda is a British specialty chemicals company producing consumer goods and crops and health care solutions. The group’s crop science solutions helped save approx. 145,709 hectares of land, and were notably used in pilot reforestation projects. Overall, Croda’s bio-based chemical solutions helped avoid over 996K Tonnes of CO2e in 2022.	12, 2
Sub Theme: Plant-Based		
Natura & Co Brazil, Consumer Staples Portfolio Weight: 1.4%	Natura produces and markets packaged beauty products worldwide. We consider Natura to generate a strong positive impact as the company aims to invest in regenerative agriculture and in local communities, to sustainably source new natural ingredients, and create value for small holder suppliers.	12, 15



Water Ecosystem

Water Treatment



Sea/Freshwater Management



Water Treatment

Case Study: Xylem

Most of the water on Earth is saline (i.e. seas and oceans), with freshwater making up just 3%. Rising global population and climate change are increasing water scarcity and insecurity, especially in low-income countries. While water is inherently a non-substitutable and scarce resource, human actions are exacerbating the situation and it is estimated that 80% of waste water is released untreated, degrading the quality of existing water supplies. Therefore, water treatment solutions are badly needed to help ensure access to clean water and avoid further contamination of rivers and groundwater.



Inputs

17.8k Employees
206m in 2022 R&D Expenditure



Activities

Xylem is a global water technology company with a portfolio of products and services addressing different stages of the water cycle, including the delivery, measurement and use of drinking water, the collection, testing, analysis and treatment of water and wastewater, and the return of water to the environment.



Outputs

In 2022, it avoided 0.47bn m3 of non-revenue water¹, treated 3.08bn m3 of water for reuse and prevented 1.99 bn m3 of polluted water from flooding communities or entering waterways.



Outcome

As an equipment, technology and services company, Xylem provides solutions for the management of scarce water resources to a diverse customer base: water and wastewater utilities that treat, monitor and distribute drinking water or treat and analyse wastewater and stormwater; engineering, procurement and construction firms that work with utilities to design and build water infrastructure; as well as industrial, commercial and residential customers. Its solutions for utilities (as well as some industrials) include, among other things, water and wastewater pumps, filtration, disinfection and treatment equipment, mobile dewatering equipment and services, as well as smart meters, sensor devices and analytical instrumentation (to monitor quality, flow, and other metrics), networked communication devices, software, and data analytics services (for condition assessment, pressure monitoring, leak detection...). To industrial, commercial, and residential customers, its main products include filtration and treatment systems, pumps, valves, heat exchangers and dispensing equipment systems.



Impact

Xylem's solutions enable access to clean water, facilitate wastewater management, mitigate water scarcity by reducing losses, enable the treatment and recycling of water, and help avoid the discharge of polluted water in the environment.

Portfolio Weight: 4.2%

KPI: Water treated for reuse using Xylem solutions (cumulated), 10.25 bn m3



¹ Water that has been produced and is «lost» before it reaches the customer

Sea/Freshwater Management

Case Study: Halma

Water safety, quality and leakages are increasingly critical global issues. While fresh water is an inherently scarce resource, human actions are exacerbating the situation and it is estimated that 80% of waste water released is untreated or not properly treated, degrading the quality of water ecosystems.



Inputs

8,141 Employees



Activities

Halma is a global group providing a range of life-enhancing and life-saving tools, technologies and services to a wide array of client industries. Halma's Environmental & Analysis division produces water analysis and treatment solutions.



Outputs

Halma's water monitoring products are used on more than 150,000 kilometres of water pipelines, to reduce water losses and preserve water quality. Halma moreover enables over 200 million water tests per year, and supplies more than 5 million water quality tests to partners working in international relief.



Outcome

In 2021, Halma unveiled new impact metrics, to better demonstrate the alignment to its purpose, and the positive contributions of its products, which are substantial and diverse. Halma's water-related solutions contribute to healthier water ecosystems and greater access to potable water.



Impact

Via its water solutions, Halma helps preserve water ecosystems and helps ensuring access to safe drinking water, enabling broader positive impacts on the health of people and the planet.

Portfolio Weight: 2.2%

KPI: Water tests enabled annually, 200 m



A list of other companies contributing towards Water Ecosystem within AXA IM Biodiversity is provided below, portfolio weights are as at 31/12/2022.

Company, Country, Sector	Contribution to Water Ecosystem	UN SDG Contribution
Sub Theme: Water Treatment		
Evoqua Water Technologies US, Industrials Portfolio Weight: 3.2%	Evoqua provides water treatment solutions, offering services, systems, and technologies to support its public and industrial customers' full water lifecycle needs. Evoqua's products and services allow municipalities and corporate customers to treat influent and effluent waters for a large range of applications, including high-materiality applications such as drinking water and aquaculture. Furthermore, leveraging its extensive service network (the largest in North America), data intelligence and a digital platform, it enables its customers to reduce their water-associated costs and offers high reactivity.	6, 12
Ecolab US, Materials Portfolio Weight: 2.9%	Ecolab is the global leader in water, hygiene and infection prevention solutions. Ecolab's products & services provide significant materiality as they allow its customers to reduce their environmental footprint, especially in terms of water usage. It also offers additionality thanks to significant investment in innovation and science-based solutions and the positive environmental and social impact of a majority of its products.	6, 3
Horiba Japan, Information Technology Portfolio Weight: 1.9%	Horiba manufactures and sells high-precision measuring equipment and analyzers. Horiba's products are widely used to monitor global greenhouse gas emissions and other emissions from cars and heavy industrial activities and therefore play a key role in the fight against climate change and biodiversity loss (SDGs 12 and 13).	9, 12
Veolia Environnement France, Utilities Portfolio Weight: 1.5%	Veolia provides essential and critical, quality water, waste and energy services to municipalities and companies globally. In 2022, Veolia provided over 100 million people with drinking water, over 90 million people with waste water management services and over 45 million people with waste collection services. Veolia continues to deploy smart meters with over 9 million installed as of 2022, contributing to greater resource-use efficiencies.	11, 6
Sea/Freshwater Management		
Agilent Technologies US, Health Care Portfolio Weight: 4.4%	Agilent Technologies operates in life sciences, diagnostics and analytical laboratory technologies industries. Agilent helps Oil & Gas companies and producers of materials for industrial applications to measure and control the quality of their finished products and to verify the environmental safety of their operations.	3, 12
Thermo Fisher Scientific US, Health Care Portfolio Weight: 4.1%	Thermo Fisher is a life-science company providing environmental analysis technologies that facilitate water, air, soil and contaminant monitoring, increasing safety and improving customers' environmental footprints.	3, 12, 15
Danaher US, Health Care Portfolio Weight: 4.0%	Danaher designs, manufactures and markets professional, medical, industrial, and commercial products and services. Danaher's solutions are highly material as they facilitate the development of vaccines and therapies, the diagnosis of diseases and pathologies and contribute to the better management of water resources.	3, 6
Eurofins Corporation France, Health Care Portfolio Weight: 2.4%	Eurofins is a leading provider of analytical services. Eurofins enables other companies and institutions to safeguard the environment, protect crops, ensure food, air, soil, water safety.	3, 12, 6





Sustainable Materials

Plastic Packaging Alternatives



Future Materials



Green Plastics



Plastic Packaging Alternatives

Case Study: Verallia

The amount of plastic in the ocean is expected to double in the next 15 years, without any urgent action to tackle pollution. By 2050 there could be more plastic than fish in the sea (by weight). We believe that we need to rapidly evolve habits by shifting towards more sustainable alternatives to plastic, particularly in the packaging sector, where virgin plastic still dominates. Glass is a widely recycled material and is a viable alternative to plastic. Glass still has some negative externalities, but offers a more compelling sustainability profile versus incumbent packaging materials. Ongoing innovations in recycling technology as well as form factors continue to support the use case for glass as a packaging material.



Inputs

83,500 Employees
55.7% ratio of cullet (waste crushed glass) use in production



Activities

Verallia is among the largest manufacturers of glass packaging for the food and beverage industry globally, with leading positions across several European markets.



Outputs

The Group manufactured about 17 billion units of glass packaging (bottles and jars) in FY22, and is the third largest glass packaging manufacturer globally, serving approx. 10,000 corporate customers.



Outcome

Glass is an alternative to plastic packaging, which has been one of the largest sources of ecosystem pollution. As a leading glass packaging producer, Verallia plays a strategic role in the glass value chain, and is contributing to increase the circularity of glass packaging by accelerating cullet (waste crushed glass) use.



Impact

Verallia's products contribute to the fight against plastic pollution. The impact of plastic on ecosystems has become one of the most alarming issues threatening biodiversity. Compared to plastics, glass collection and sorting is more mature, and glass is readily and infinitely recyclable and reusable, as it does not lose material value at every recycling loop (unlike plastic which is most often downcycled). Recycling glass by remelting glass waste is less energy- and emissions-intensive compared to manufacturing it from virgin raw materials. Verallia is moreover beginning to explore economic models based on reuse, which will contribute to further mitigate the environmental footprint of packaging.

Portfolio Weight: 3.0%

KPI: % of used glass pieces in the total raw material, 55.7%



Future Materials

Case Study: Stora Enso

Forests contain an estimated 80% of the world's biodiversity. Harvesting forests, raising monoculture plantations and pesticide use may have significant impacts on species abundance and diversity. One of forests' most crucial services is their capacity to slow climate change by absorbing atmospheric CO2 via photosynthesis. At the same time, deforestation, forest degradation and land use change contribute approximately 12% of the world's GHG emissions. Many of the world's remaining forests are under increasing threat due to agriculture expansion, timber extraction, fuelwood collection and other activities. Although the pace of global deforestation has slowed since the 1990s, it remains high with around 13m hectares lost each year.



Inputs

21,000 Employees
EUR 112,000,000 R&D Expenditure



Activities

Stora Enso provides packaging, building solutions, biomaterials and other forest products for a range of applications. It is one of the largest private forest owners in the world, managing a total area of 2 million hectares.



Outputs

Stora Enso's business opportunities are strongly driven by innovative applications to replace oil-based materials (e.g. plastic in food packaging) with renewable and sustainable materials. Approximately 20% of its forest land is set aside for conservation, and biodiversity is maintained, monitored and enhanced across forest landscapes.



Outcome

Stora Enso is a market leader in LPB (Liquid Packaging Board), FSB (Food Service Board) and CUK (Coated Unbleached Kraft) in the world. It demonstrates sustainable efficient management of natural resources; reduces waste generation through reduction, recycling and reuse; and ensures the conservation, restoration and sustainable use of forests.



Impact

Stora Enso contributes to fight climate change¹ and environmental pollution, it supports its customers in their efforts to phase out single-use plastic solutions, and sustains biodiversity in its forests.

Portfolio Weight: 2.5%

KPI: Climate Impact,¹ -11 millions tonnes of CO2e



¹ Stora Enso estimates its overall "climate impact" to be around 11m tonnes of CO2e avoided/removed from the atmosphere annually. This is based on 1.5m tonnes removed by forest assets, 2.5m from products storing carbon and 17.2m from products substituting fossil-based products. Value chain emissions equalled 10.2m tonnes CO2e

Green Plastics

Case Study: Origin Materials

The chemical and materials industries have been significantly dependent on fossil fuels for the production of compounds and polymers in the past century. Globally, we have produced around 8.3 billion tonnes of plastic since the 1950s, generating 6.3 billion tonnes of waste. Of this waste, around 9% has been recycled and almost 80% has accumulated in landfills or left in the environment. It is estimated that if current trends continue, the volume of plastic waste in landfills or the environment could double by 2050. Because of an indisputable track record in pollution, societies are also looking to gradually move away from fossil-based plastics. While there is no single-solution to solve the global plastics pollution crisis, bioplastics may play a role in reducing the prevalence of fossil-based plastics in our lives, notably as research strongly suggests chemicals from fossil-based plastics can have adverse health impacts.



Inputs

100% bio-based waste feedstocks



Activities

Origin Materials has made its purpose to help manufacturing companies decarbonize via the supply of alternative chemicals and compounds to those historically coming from fossil-based feedstocks.



Outputs

Origin Materials has developed chemicals derived by 100% from bio-based waste feedstocks. Origin's proprietary and patented process can convert biomass, plant-based carbon into building-block chemicals. Via its patented process, Origin also produces high quality carbon black and activated carbon, materials which can be used in food and water treatment and in filtration systems.



Outcome

Origin Materials' bio-based chemicals contribute to reducing the environmental footprint of a variety of solutions, the most notable being the displacement of fossil-based plastic. By using biomass waste from forests assets, Origin states a carbon negative footprint. Origin reports a negative life-cycle carbon footprint for its solution, which has been validated by external review.



Impact

It is estimated that the full cycle of plastic production produced 2% of global emissions in 2019¹, this ratio could increase threefold by 2050 without urgent action. Bio-based plastics can play a role in reducing dependence on new fossil-fuel extraction to produce polymers, however waste-based bio-feedstocks are considered to be among the most impactful as they make use of waste materials, and do not compete with land and/or commodities typically used for food, especially corn and sugar cane.

Portfolio Weight: 1.5%

KPI: Validated carbon intensity of commercial-scale production of Chloromethyl furfural (CMF), -1.2 kg CO2e/kg CMF



A list of other companies contributing towards Sustainable Materials within AXA IM Biodiversity is provided below, portfolio weights are as at 31/12/2022.

Company, Country, Sector	Contribution to Sustainable Materials	UN SDG Contribution
Sub Theme: Plastic Packaging Alternatives		
Mondi US, Materials Portfolio Weight: 3.4%	Mondi is a global leader in packaging and paper. Mondi's products can represent a more sustainable solution to the environmental issue created by packaging in the context of growing e-commerce and product shipping.	12, 15
Ball Corp US, Materials Portfolio Weight: 3.0%	Ball is a global leader in aluminium packaging, playing a strategic role in accelerating the circularity of aluminium packaging. Aluminium is infinitely recyclable and has an already mature collection and recycling value chain.	12, 9
Smurfit Kappa Ireland, Materials Portfolio Weight: 2.8%	Smurfit Kappa provides paper-based packaging, an alternative to plastic packaging. Smurfit Kappa relies on a majority of recycled and recovered fibres, and sustainably procured and certified fibres, to manufacture its products.	12, 15
Sub Theme: Future Materials		
UPM-Kymmene Finland, Materials Portfolio Weight: 2.0%	UPM-Kymmene Oyj engages in the manufacture and sale of printing and writing papers as well as timber-based construction materials. UPM's products represent a more sustainable solution to the environmental issue created by packaging in the context of growing e-commerce and product shipping.	12, 15
Corbion Netherlands, Materials Portfolio Weight: 1.8%	Corbion provides sustainable ingredients and materials across a range of industries. Corbion's solutions help combat food waste and food-borne pathogens, and optimize health benefits (through fortification, safety and reformulation) of foods. Corbion is moreover a leader in lactic acid production, a bio-based chemical used across industries for its antibacterial properties, and for its role in the production of a specific type of bio-plastics.	12, 2
Vulcan Energy Australia, Materials Portfolio Weight: 1.5%	Vulcan Energy Resources aims to deliver carbon neutral lithium through direct lithium extraction and geothermal energy in Europe. Vulcan mainly provides clean, decarbonized energy to households and facilitating electrification. Vulcan's proprietary processes allow for great water-, land-, and carbon-efficiency improvements in lithium mining and refining.	7, 6, 13

¹ Origin's proprietary and patented process can convert waste biomass and waste plant-based carbon into building block chemicals including Chloromethyl furfural (CMF)



Recycling & Recirculation

Recycling



Goods Recirculation



Apparel Waste Reduction



Recycling

Case Study: Li-Cycle

Demand for battery is significant and results from a push by governments and by companies towards battery-powered technologies to meet carbon emission reduction targets through electrification and renewable energy uptake. One of the most battery-hungry industry is transportation; the 16+ million EVs on the road today should reach their end-of-life stage and enter the reuse/recycling market by 2040. These market dynamics, along with the historically low recovery levels for battery materials, cumulated with the growing environmental and social impacts of raw material sourcing and waste treatment, mean that a more efficient and sustainable process to recover spent battery materials is urgently needed.



Inputs
400+ Employees



Activities
Li-Cycle extracts the materials from spent batteries and sells the recycled raw materials to stakeholders in the battery value chain, for the production of new batteries.



Outputs
Li-Cycle has developed an innovative, vertically integrated operating process to efficiently recover significantly larger amounts of battery materials than what has been regularly achieved in the industry till now, without substantial environmental impacts. Li-Cycle operates a processing capacity of approximately 20,000 tonnes per year within three plants across North America.



Outcome
Li-Cycle's solution for battery material recovery comes at a time when battery demand is at a record high - and expected to increase dramatically - as governments and companies work on vehicle electrification to decarbonize transportation. The battery economy is however generating increasing stress on ecosystems and supply chains, coming from the extraction of virgin raw materials (e.g. cobalt in Congo) and via historically weak battery recycling rates.



Impact
Li-Cycle's battery material recovery process is one of the most efficient known to date and does not rely on smelting. Through its chain of mechanical and chemical recycling processes, Li-Cycle can recover 95% of the batteries' raw materials. Recycling processes available today recover on average only about 40-50% of materials in lithium batteries. Via its solution, Li-cycle contributes to wider environmental footprint mitigations across the life-cycle of electric vehicles.

Portfolio Weight: 1.9%
KPI: Total Black Mass produced, 1,880 tonnes



Goods Recirculation

Case Study: Adevinta

The world's current rate of consumption is so high that it equates to the resource use of 1.8 planets (a number that reaches 2.8 in Europe), an unsustainable level that harms biodiversity, exacerbates climate change and that is bound to worsen inequalities on a global scale. It is crucial that we move towards a more circular consumption model where more resources are recycled, and more products are reused. Overall, the circular economy remains at an early stage, but consumption behaviour is changing. Reusing can save consumers money while also driving a lower environmental impact. Solutions such as digital peer-to-peer platforms enable the extension of the useful life of pre-owned goods while reducing waste and promoting more sustainable consumption.



Inputs
5.7k Employees
EUR 192m in 2022 R&D Expenditure



Activities
Adevinta is the leading online classified group in Europe. Adevinta owns leboncoin (French-based online marketplace for second-hand items & services), eBayKleinanzeigen (German-based online marketplace for second-hand items & services) etc.



Outputs
Adevinta is the largest online classified group in the Western world with 2.5 billion visits per month on average and a leading position in 15 European countries, and as such connects professional and private buyers and sellers. It allows its private users to consume at a reduced cost and to generate extra income.



Outcome
As a facilitator of second-hand trade, Adevinta has a very significant positive environmental impact, extending the useful life of products and avoiding the extraction and consumption of additional resources. It participates in the Second Hand Effect project, a method developed by its parent company (Schibsted) and the Swedish Environmental Institute to measure the positive impact of facilitating second-hand transactions (the second hand effect), and found that in 2021, it contributed to save 25.3m tonnes of CO2e (equivalent to 9.6 years car-related emissions in Paris), 1.53m tonnes of plastic (equivalent to 28bn of 2L plastic bottles), 9.1m tonnes of steel (enough to build 10.1m EVs) and 930m tonnes of aluminium (equivalent to 62bn soda cans).



Impact
Adevinta facilitates second-hand buying and selling, thus allowing users to consume in a more economical and environmentally responsible way (by avoiding the use of resources and the emissions associated with the production of new products).
Portfolio Weight: 0.9%
KPI: Carbon emissions avoided by second-hand trade on Adevinta platforms, 25.3m tonnes of CO2e



Apparel Waste Reduction

Case Study: Kornit Digital

Nearly 20% of global waste water is produced by the fashion industry. The fashion industry uses approximately 93 billion cubic meters of water per year, and textile dyeing is one of the largest polluters of water globally. Moreover, around 70% of an apparel item's environmental footprint comes from its production. Heightened consumer awareness of the detrimental impact of the fashion industry on the environment is pushing companies to adopt more resource-efficient manufacturing methods. Large scale apparel printing generates numerous negative externalities, such as intensive water use and chemical discharges from inks. Screen printing, which remains the most common form of printing for apparel, generates significant amounts of waste water linked to equipment cleaning. Additionally, the cleaning process means that water discharges often contain ink waste, which can be hazardous for ecosystems.



Inputs

2,601 Employees
USD 13,251,000 R&D Expenses



Activities

Kornit manufactures and markets digital printing equipment and non-toxic printing inks, to be used in apparel and textile printing.



Outputs

About 82% of revenues came from the sale of printers and their accessories and special inks, and 18% of revenues came from maintenance services in FY 2022.



Outcome

Via its range of large Direct-to-Garment and Direct-To-Fabric digital printers, Kornit provides apparel manufacturers and printers with solutions that significantly reduce industrial water consumption but also reduce the discharge of toxic chemicals, by eliminating the need to wash equipment after repeated use. When using a Kornit printer, a customer can save up to 55.7 million litres of water compared to traditional printing methods.



Impact

Kornit's solutions permit to drastically reduce the environmental footprint of the apparel printing process, notably when comparing with most common printing processes used in the industry. Through Life cycle assessments, Kornit reports that its printers can reduce water consumption by 95% on average, compared to traditional printing methods. Kornit moreover caters to on-demand production models, which reduces the environmental footprint of the textile industry

Portfolio Weight: 0.4%

KPI: Annual water savings enabled by Kornit's Presto Max, 55.7 mn litres.



A list of other companies contributing towards Recycling & Recirculation within AXA IM Biodiversity is provided below, portfolio weights are as at 31/12/2022.

Company, Country, Sector	Contribution to Recycling & Recirculation	UN SDG Contribution
Sub Theme: Recycling		
Darling Ingredients US, Consumer Staples Portfolio Weight: 4.3%	Darling transforms and repurposes waste fats and by-products from the agrifood industry into useful products. Darling also produces renewable diesel made from used cooking oil, rendered animal by-products and fats and inedible corn oil that is chemically identical to diesel - but less carbon intensive.	12, 2
Republic Services US, Industrials Portfolio Weight: 3.6%	Republic Services is a waste management company operating in the US. Republic Services provides a vital service and reliable collection of municipal waste. The safe collection and treatment of hazardous waste is also crucial for environmental protection.	11, 12
TOMRA Systems Norway, Industrials Portfolio Weight: 2.4%	TOMRA Systems provides sensor-based waste collection, sorting, recycling, material recovery equipment for companies involved in the recycling, food and mining industries. Via its Reverse Vending Machines (RVM), TOMRA participates in waste collection and enables consumers and companies to divert plastic, aluminium and glass packaging from waste streams.	12, 9
Befesa Germany, Industrials Portfolio Weight: 1.6%	Befesa is a global leader in recycling services to the steel (produced with electrical arc furnaces- or EAF) and aluminium industries. Its solutions drive improvements in resources efficiency and promote the recycling of steel and aluminium waste.	12, 9
China Everbright Environment China, Industrials Portfolio Weight: 0.9%	China Everbright Environment offers solutions to process, dispose, recycle and valorize waste, generate renewable energy, supply and treat water, supply heating and by developing and manufacturing equipment used in waste-to-energy and water treatment operations (among other things).	11, 6, 7, 12
Sub Theme: Goods Recirculation		
Mercari Japan, Consumer Discretionary Portfolio Weight: 1.0%	Mercari is a Japanese company operating C2C marketplaces platforms in Japan and the US. Mercari's marketplaces contribute to reducing waste as they allow users to buy second-hand and sell used products rather than throw them away, thus avoiding the environmental impact associated with producing new items.	12, 9

Investor Contribution: Active Stewardship

As our strategy invests only into listed equities, we believe one of the most material tools to contribute to deliver impact as an investor, in addition to investee contribution, is through our active ownership and stewardship strategy. This consists of using our shareholder rights to urge companies to contribute to global sustainability related targets. Active engagement with companies is focused on a number of key themes including Climate Change, Biodiversity, Social Relations and Public Health and Governance, with 76% of our engagements targeting UN Sustainable Development Goals in 2022. We have rolled out a clear process for selecting engagement priorities at an AXA IM level, as defined in our [Engagement policy](#), notably proactive engagement on material ESG areas. To ensure we allocate sufficient effort to enable change, proactive engagements are conducted

with a limited number of companies constituting our **Focus list** – a priority list of circa 50 companies for which intense and repetitive engagement is conducted on one or two key issues. We also conduct **Thematic projects** on specific themes, which cover a wider universe of companies, aimed at supporting companies in the reduction of their negative externalities, to deliver positive impact and improve impact-related disclosures. We conduct engagement with issuers and track progress – achieving effective change can take time, and we define a timeframe which we consider reasonable for achieving these objectives, depending on the nature of the change we are targeting and the underlying concerns. These also differ according to the country of the issuer and the relevant thematic area. Furthermore, we vote in a manner that is intended to be beneficial

for the long-term, sustainable value of the companies in which we invest. Areas of support or dissent can relate to a number of sustainability related issues, such as executive remuneration, climate and diversity – which we have captured within our dedicated voting policy. Voting may occasionally be used as an escalation option if we believe engagement on a thematic issue has stalled.

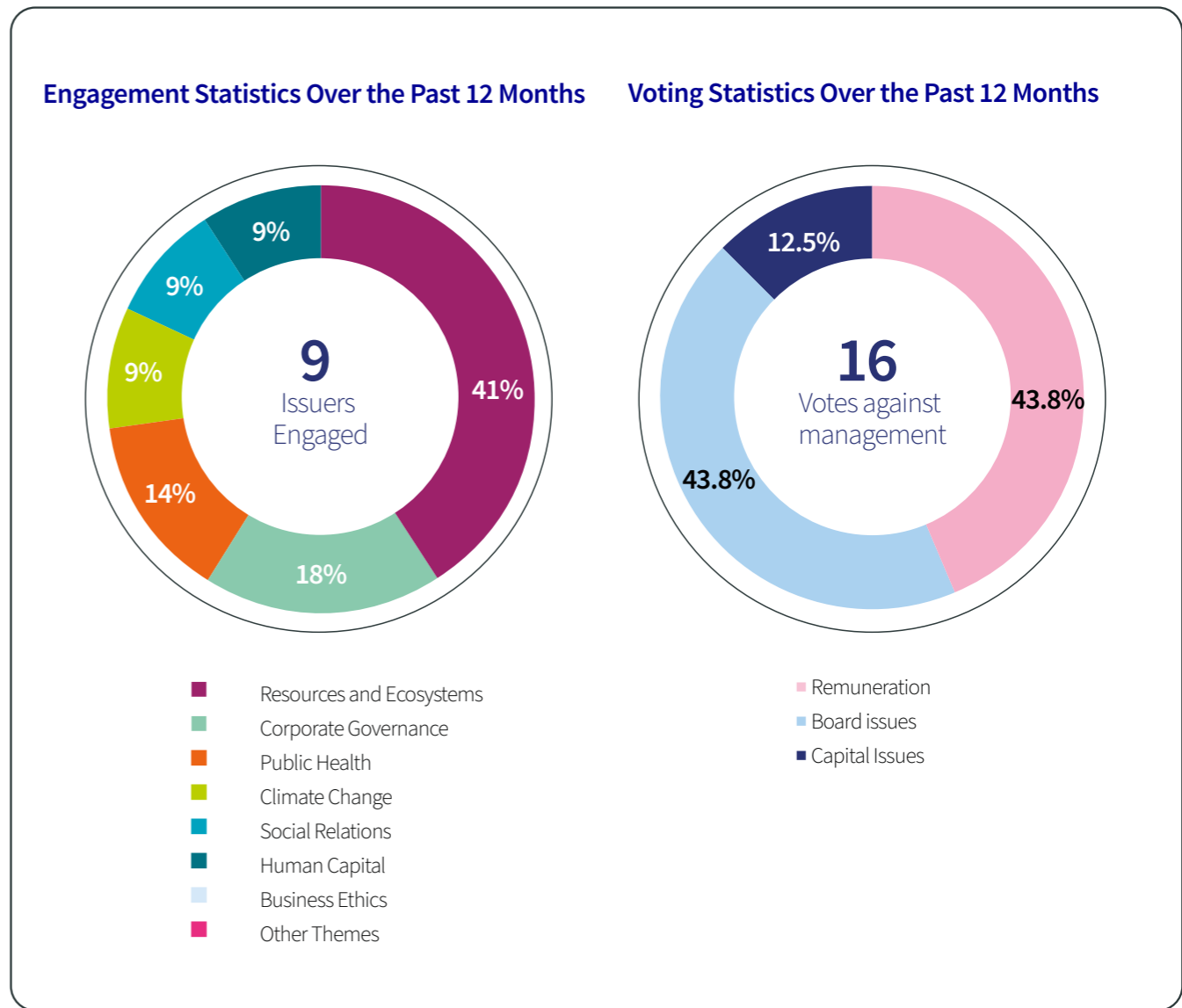
We also participate in a number of industry groups, selecting those which focus on topics where we believe our involvement will have a material impact, and join forces with other investors and stakeholders to have a greater impact. Our [2022 Stewardship Report](#) details collaborative engagements, investor initiatives and statements we have led, supported and/or contributed to.



Engagement Statistics 2022

Over 2022, we engaged with 9 companies held in AXA WF ACT Biodiversity, representing 24% of the portfolio.

We voted in 19 meetings with 42% of those meetings including at least 1 vote against management. In total we voted against management in 16 instances, representing 6% of our total votes.



Engagement Case Studies 2022



Stora Enso

Strategy theme: Sustainable Materials – Future Materials

Theme(s) targeted by the engagement:

Resources & Ecosystems

SDG(s) targeted by the engagement:



Objectives:

- Detail the evolution of the company’s biodiversity approach

Engagement summary: We identified Stora Enso as one of the companies with a potential significant biodiversity footprint. Proactively, we initiated discussions with Stora on how they identify their impact on biodiversity and what their strategy is to manage this. This is our first discussion with Stora on the topic, the company is open to dialogue, and we will continue this engagement in 2023. We discussed several related issues including: forest certification volumes and quality; integration of biodiversity related indicators by the company and use of new tools and methods to drive the company’s action on biodiversity; biodiversity-related issues as waste and water management.

Date of last meeting: 20/12/2022

Engagement progress tracker: Step 2, the company responded



Republic Services

Strategy theme: Recycling & Recirculation - Recycling

Theme(s) targeted by the engagement:

Climate Change

SDG(s) targeted by the engagement:



Objectives:

- Provide details about emission methodologies
- Provide details about landfill gas emissions
- Provide details about fleet management and recycling

Engagement summary: We initiated a dialogue with Republic Services about its climate commitments, as the company is part of our engagement focus list. This engagement took place on an individual basis. The company has SBTi validated targets since 2019 and clearly outlined plans on how to achieve them. They are notably accelerating in terms of landfill gas collection and recycling. Republic Services is clearly ahead of its two US peers, both in terms of track record and ambition. We will follow up in 2023 to update the analysis with new data and notably discuss the next steps for Republic Services.

Date of last meeting: 21/09/2022

Engagement progress tracker: Step 2, the company responded

Negative Externalities

Each company’s corporate practices, or products and services, may significantly undermine the positive impact it is generating elsewhere. We therefore assess how companies are addressing the negative externalities of their activities. We have provided below some examples of the negative externalities generated by the companies presented in this report.

Darling Ingredients

Darling’s process to manufacture its renewable diesel, in a Joint-Venture with Valero, involves hydrotreating, which uses high pressure hydrogen to remove the oxygen present in the feedstock. Hydrogen production relies in majority on grey hydrogen (95% of global production), which uses natural gas without carbon capture, and is therefore carbon intensive. Since 2013, Valero operates the first and only refinery equipped with carbon capture technology. On site are two steam methane reformers producing hydrogen, which were retrofitted to capture carbon in the production process of hydrogen. Valero’s blue hydrogen (using carbon capture) therefore contributes to reducing some of the cradle-to-grave emissions of the JV’s renewable diesel, and ensuring it is not an inefficient alternative to fossil fuel.



Kerry Group

Although Kerry’s recent overarching sustainable strategy aims for 100% of all raw materials to be sustainably procured by 2030, and we notice some progress towards RSPO certification of volumes, non-RSPO palm volumes remain high, standing at 61% in 2022. Absolute palm oil volumes are decreasing however, as Kerry is moving out of consumer foods, and as its taste and nutrition portfolio shifts to higher nutrition/health/preservation value-add solutions. We have engaged with the company in the past to encourage greater use of certified palm oil and a potential phase-out of palm oil.



Corbion

Corbion’s bioplastics solutions target the food/single-use packaging sector. Although these bioplastics can be composted and recycled under specific conditions, current treatment capacities are limited (especially in some emerging countries with weaker waste collection infrastructure). Therefore, while it remains an alternative to fossil-based polymers, bioplastics can produce similar types of environment pollution. Their cradle-to-grave footprint remains however significantly lower than the fossil-based polymers typically used in single-use packaging. In some very specific cases, composted bioplastics can be used as feedstock for new crops. But more efforts to close the circularity loop, by recycling discarded items into new polymers will be welcome. We engaged with the company on this matter, whose response was positive. We were happy to see that in 2021, Corbion initiated actions on PLA circularity. The circularity program initiated, injects waste bioplastic in the production stream. Corbion has also been testing the viability of take-back programs to enable packaging reuse. Greater circularity will also help avoid the potential land-use-change impacts associated with possible hikes in biopolymer demand.



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For more information on sustainability-related aspects please visit <https://www.axa-im.com/what-is-sfdr>

The ESG data used in the investment process are based on ESG methodologies which rely in part on third party data, and in some cases are internally developed. They are subjective and may change over time. Despite several initiatives, the lack of harmonised definitions can make ESG criteria heterogeneous. As such, the different investment strategies that use ESG criteria and ESG reporting are difficult to compare with each other. Strategies that incorporate ESG criteria and those that incorporate sustainable development criteria may use ESG data that appear similar but which should be distinguished because their calculation method may be different.

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